

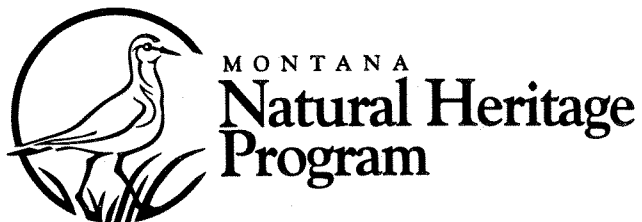
Roadside Bird Counts on BLM Lands in Petroleum and Fergus Counties, Montana

A Report to:

Bureau of Land Management
Lewistown Field Office
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ABSTRACT

Twenty-three roadside bird transects were run once during late May-early July 1998 or 1999 to document bird presence and relative abundance on and near BLM lands mostly in Petroleum County (20 routes) and adjacent Fergus County (3 routes). Routes tended to be run in morning ($n = 16$), but some ($n = 7$) were run in the afternoon to increase coverage as weather permitted. Each roadside transect consisted of 10 survey stops or point counts (one route consisted of 7 stops), spaced 0.5 miles apart. At each stop counts were conducted for 3 min during which all birds detected within a radius of 150 m were recorded. Gross vegetative land cover associated with each point was also recorded.

Low-stature sagebrush (*Artemisia tridentata*, often < 0.5 m tall) was classified as the dominant cover type at 173 points (76.2%) of all 23 routes (on only two routes was this dominant at < 5 points). Mixed grassland/cropland/pasture was dominant at 34 points (15.0%) of 14 routes, and ponderosa pine (*Pinus ponderosa*) savanna was the dominant cover type on 20 points (8.8%) of 5 routes. Each vegetation type was present at additional points to various degrees, and influenced the presence of some bird species at particular counts.

Fifty-eight bird species were detected, of which three species occurred on more than half of the point counts: Western Meadowlark (97.4%), Vesper Sparrow (85.9%), Lark Bunting (61.2%). Two species considered sagebrush obligates, Brewer's Sparrow and Sage Thrasher, were detected on 27.3% and $< 1.0\%$ of the point counts, respectively. The relatively low abundance of Brewer's Sparrow coupled with the high abundance of Vesper Sparrow and Lark Bunting indicates that low-stature sagebrush cover is often of medium to low density and intermixed with a significant over of grasses. However, abundance of Brewer's Sparrow was probably underestimated because of the number of point counts conducted in early July, by which time this species was probably less vocal. Sage Thrashers use taller and denser sagebrush, which was relatively rare along the routes, and their very low abundance is a reflection of the scarcity of suitable habitat. Other species often associated with grasslands were detected on relatively few point counts: Upland Sandpiper (9.3%), Long-billed Curlew ($< 1.0\%$), Short-eared Owl ($< 1.0\%$), Sprague's Pipit ($< 1.0\%$), Savannah Sparrow (4.4%), Grasshopper Sparrow (9.7%), Baird's Sparrow ($< 1.0\%$). Brown-headed Cowbird was detected on 13.2% of the point counts, usually in the presence of cattle or pasture.

The BLM lands in the survey area are dominated largely by low-stature sagebrush, and provide an opportunity to manage especially for some sagebrush obligate species. Sage Grouse were not detected, but special surveys for this species merit consideration. Grassland species such as the regionally endemic Sprague's Pipit and Baird's Sparrow, of special concern for a number of land management agencies, do not currently occur in the area in significant numbers.

ACKNOWLEDGMENTS

The bird surveys reported here were proposed and supported by Michelle Williams (Lewistown Field Office, BLM). The work was funded by a Challenge Cost Share Agreement between the Lewistown Field Office, BLM and the Montana Natural Heritage Program—a collaborative effort of The Nature Conservancy and the Natural Resource Information System. A special thanks is due Michelle for supporting this work, her appreciation of the vagaries in central Montana weather and road conditions, and her patience in seeing the project completed.

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INTRODUCTION

Grassland and shrubsteppe birds have shown more consistent population declines over the last 30 years than any other group of North American bird species (Saab and Rich 1997, Paige and Ritter 1999, Peterjohn and Sauer 1999). Declines are largely attributable to a variety of anthropogenic disturbances to grassland and shrubsteppe habitats, such as grazing, burning, plowing, spraying and chaining, that lead to broad-scale habitat losses (Vickery et al. 1999). The variety of bird species found in these habitats is less than in broadleaf and coniferous forests, but several species (termed "obligates") are restricted largely to grassland and shrubsteppe (Knoph 1994, Paige and Ritter 1999, Vickery et al. 1999), and their population trends are of special concern to land management agencies responsible for the stewardship of rangelands.

Montana Partners In Flight (PIF) recognizes five bird species* associated with sagebrush shrubsteppe as of priority conservation concern: Sage Grouse (Level I), Loggerhead Shrike (Level II), Sage Thrasher (Level II), Brewer's Sparrow (Level II), Lark Sparrow (Level III). Level I species are those needing conservation action, Level II species are those requiring additional monitoring and/or the design of conservation actions, and Level III species are those of local concern that may serve as added criteria in the design and selection of conservation or monitoring strategies (Casey 2000). Montana PIF also recognizes 13 bird species associated with mixed-grass prairie that are of priority conservation concern: Ferruginous Hawk (Level II), Northern Harrier (Level III), Mountain Plover (Level I), Long-billed Curlew (Level II), Burrowing Owl (Level I), Short-eared Owl (Level III), Sprague's Pipit (Level I), Lark Bunting (Level II), Grasshopper Sparrow (Level II), Baird's Sparrow (Level I), McCown's Longspur (Level II), Chestnut-collared Longspur (Level II), and Bobolink (Level III).

Many of the shrubsteppe and grassland species on the Montana PIF conservation priority lists occur in central Montana (Ellis et al. 1996) and are likely to occupy lands administered by the Lewistown Field Office of the Bureau of Land Management (BLM). Interest was expressed by BLM personnel in a rapid inventory of grassland and shrubsteppe birds of the former Judith Resource Area, for which it was felt there were few recent data on non-game birds. Of special concern were BLM lands in a rectangle roughly defined south-north by Flatwillow Creek to Charles M. Russell National Wildlife Refuge and west-east by Grassrange to the Musselshell River, and encompassing the various units of War Horse National Wildlife Refuge in the Winnett area.

The roadside bird counts presented in this report are intended to 1) provide a snapshot of bird relative abundance in the areas visited, 2) establish a baseline of relative bird abundance for future avian monitoring efforts in this area, 3) provide a series of "permanent" roadside transects that can be rerun in future breeding seasons for longitudinal study of bird community and species-level dynamics, and 4) identify Montana PIF bird conservation targets occupying the study area. The information gathered should aid land managers in their design of management plans and land stewardship activities in the study area.

* Standard common names follow the American Ornithologists' Union Checklist of North American Birds, seventh edition (A.O.U. 1998) and will be used without reference to Latin binomials.

STUDY AREA AND METHODS

The area of study lies mostly in Petroleum County, but includes a small part of adjacent Fergus County to the west and north. It encompasses Tegan, Winnett, and Cat Creek and extends south to Flatwillow Creek and north to the Wilder Trail road just south of Charles M. Russell National Wildlife Refuge, bounded on the west near Highway 19 and east by the Musselshell River. Most of the study area falls within the Montana Shale Plains subsection (Nesser et al. 1997) with portions of the Montana Glaciated Plains subsection to the north. Elevation averages about 3000-3500 ft, encompassing dissected plains, hills, ridges, and floodplains formed in shale, siltstone, and sandstone. Mean annual precipitation ranges from 10-14 inches, about one third falling as snow, with dry summers. The area is used predominantly for livestock grazing with some dryland farming.

Vegetation coverage in the area includes four course-level categories (Jorgensen 1979): shrub-grasslands (=“shrubsteppe”), wetlands, mixed grasslands, and coniferous forest (= ponderosa pine woodland and savanna). Vegetation classification used at roadside point counts follows the gross categories used by the US Forest Service Northern Region Landbird Monitoring Program (Hutto and Young 1999), with some additional refinements incorporating shrub and grassland structure (J. Hoffland personal communication) suggested by Montana PIF. Because most shrubsteppe vegetation was low-stature (< 0.5 m tall) sagebrush (*Artemisia tridentata*), and points dominated by other cover types were too few to analyze in finer detail, only three major “categories” are discussed in this report: low-stature sagebrush of various densities, mixed grassland/dryland agriculture/pasture, and ponderosa pine (*Pinus ponderosa*) savanna/woodland. Pine occurs on parallel east-west trending ridges in the study area, and near C. M. Russell National Wildlife Refuge. Route habitat descriptions include mention of habitat cover at specific stops when different from the predominant type; at a few points the bird fauna was obviously influenced by wetlands or stream-side riparian vegetation (see route descriptions), and this, too, is noted for specific stops.

Point count routes were selected to pass through as much land under BLM ownership as possible (based on BLM ownership maps), given accessibility and road conditions; all routes were on secondary or tertiary unpaved roads. In a few cases (such as the Flatwillow South route) maps failed to reflect current ownership, and routes were run largely adjacent to private lands. No attempt was made to randomly place routes and points or to stratify these relative to habitat availability. The primary goal with these counts was to conduct a rapid assessment of bird species in the area, and to establish routes that can be run in future years when deemed desirable to do so. Roadside counts could provide a biased representation of bird species presence and relative abundance on smaller landscape scales, due to alteration of habitat near road corridors and how birds respond to the presence of roads. However, analyses of paired point counts on roads and adjacent off-road sites in the same habitat in forest (Hutto et al. 1995) and shrubsteppe (Rotenberry and Knick 1995) showed that road-side counts provide a good representation of the bird fauna of a study area, especially if counts are conducted from secondary and tertiary roads.

Each route consisted of 10 stops spaced 0.5 miles apart (one route consisted of only 7 stops) where birds were counted. In general, methodology at count points followed procedures discussed in detail elsewhere (e.g., Hutto et al. 1986, Ralph et al. 1993). Counts were conducted for 3 min (standard Breeding Bird Survey length) to allow for some comparison with BBS data. This shorter count period (others suggest 5-10 min counts, depending on conditions) was chosen

to increase coverage of the study area when it became apparent that weather would be an important factor in determining how many routes could be conducted. A fixed radius of 150 m was used on all counts, which varies from the BBS standard (a quarter mile, which is about 400 m). This was done to allow for a more accurate assessment of bird association to small-scale habitat conditions, which are not recorded on BBS surveys. During counts, no acoustical lure (recording or vocalization) was used to attract birds or make them more detectable. In a few cases, however, vocalizations were used following a count to aid in identification of a bird detected but not identified during the count. In a few cases, especially in forested sites, vocalizing birds were stalked after counts terminated to identify their distances from count centers. Generally, point count boundaries were estimated by pacing to objects estimated to be near count perimeters, at least until a sense of count radius was developed.

Data were recorded on standardized data collection booklets modified for Montana PIF (J. Hoffland personal communication) from an original design used by the USFS Region I Landbird Monitoring Program (Hutto and Young 1999). Distances to individual birds were recorded, but orientation from the point center was not. Species and number of individuals was also recorded. Some species were recorded flying over the circle but never landing within the count area. These were recorded as flyovers, and are reported as such for each stop where they occurred (see route descriptions in Results).

During the period when transects were conducted, especially in 1999, a campsite in the acid shale pine forest near War Horse Lake was occupied. A daily record was made of birds occupying this unique plant community (see Appendix 1), and breeding or probable breeding was also recorded. These records contribute to the information on the bird fauna of the study area that were gathered during the point count transects.

RESULTS

Twenty-three roadside transects were run once during late May-early July 1998 or 1999; counts were made at 227 points. Twenty routes were in Petroleum County and three were located in adjacent Fergus County. Low-stature sagebrush was classified as the dominant cover type at 173 points (76.2% of the total) and was dominant at multiple points on all 23 routes (on only two routes was this dominant at fewer than five points). Mixed grassland/cropland/pasture was dominant at 34 points (15.0% of the total) on 14 routes. Ponderosa pine woodland or savanna was the dominant cover type at 20 points (8.8% of the total) on five routes. Each of these cover types was present as subdominant at additional points and influenced the occurrence of some bird species at particular points; this is noted in the route descriptions that follow later in this section of the report.

Fifty-eight bird species were detected during the counts (Table 1), but only three were detected on > 50% of the points: Western Meadowlark (97.4%), Vesper Sparrow (85.9%), and Lark Bunting (61.2%). Two species considered sagebrush obligates, Brewer's Sparrow and Sage Thrasher, were detected at 27.3% and <1.0% of the points, respectively. Sage Thrashers use taller and denser sagebrush, which was rarely present in the count circles, and their very low abundance is a reflection of the scarcity of suitable habitat. Brewer's Sparrow was probably underrepresented because of the number of point counts conducted in early July, by which time this species was much less vocal. At some points where Brewer's Sparrow was not detected during the count, individuals appeared in response to "spishing" after the count was completed. Species tied to larger expanses of shrub-free grasslands were detected at relatively few points: Upland Sandpiper (9.3%), Long-billed Curlew (< 1.0%), Short-eared Owl (< 1.0%), Savannah Sparrow (4.4%), and Grasshopper Sparrow (9.7%). Of this group, Upland Sandpiper appeared to use low density sagebrush with intermixed grassland more than the other species. Two regional endemics, Sprague's Pipit and Baird's Sparrow, were detected each on <1.0% of the points (one point each on the Blakeslee route). Brown-headed Cowbird was detected at 13.2% of the points (16 routes), often in association with cattle or pasture.

Species most closely associated with ponderosa pine or riparian woodland included American Kestrel, Common Nighthawk, Northern Flicker, Western Wood-Pewee, Dusky Flycatcher, Pinyon Jay, Black-billed Magpie, Black-capped Chickadee, Red-breasted Nuthatch, House Wren, Mountain Bluebird, American Robin, Yellow-rumped Warbler, Spotted Towhee, Chipping Sparrow, Lark Sparrow, Red Crossbill, Pine Siskin, and American Goldfinch. These represent almost 33% of the total number of bird species detected during the counts even though the areal extent of the primary habitats that support them comprise only a minor fraction of the total in the study area.

Some species present in the study area were overlooked, and will require special survey techniques to detect, either focusing on specific habitats or time periods. This is especially true of wetland and nocturnal species (waterfowl, shorebirds, owls, goatsuckers). For example, a Sora nest with 9 eggs was found on 3 July 1998 in emergent vegetation at the stock reservoir (T16NR26ES13SWSE) adjacent to stop 10 of the Valentine-Dovetail Road route. This species was never recorded during the point counts, even though small stock ponds are present in many places in the study area. Also, Common Poorwill was detected every evening the campsite in the acid shale pine woodlands was occupied (see Appendix 1), but was never detected during the point counts in other pine woodland sites.

Table 1. Bird species detected on 23 roadside point-count routes in 1998-1999. Total number of point counts was 227 (all routes with 10 points except one with 7 points).

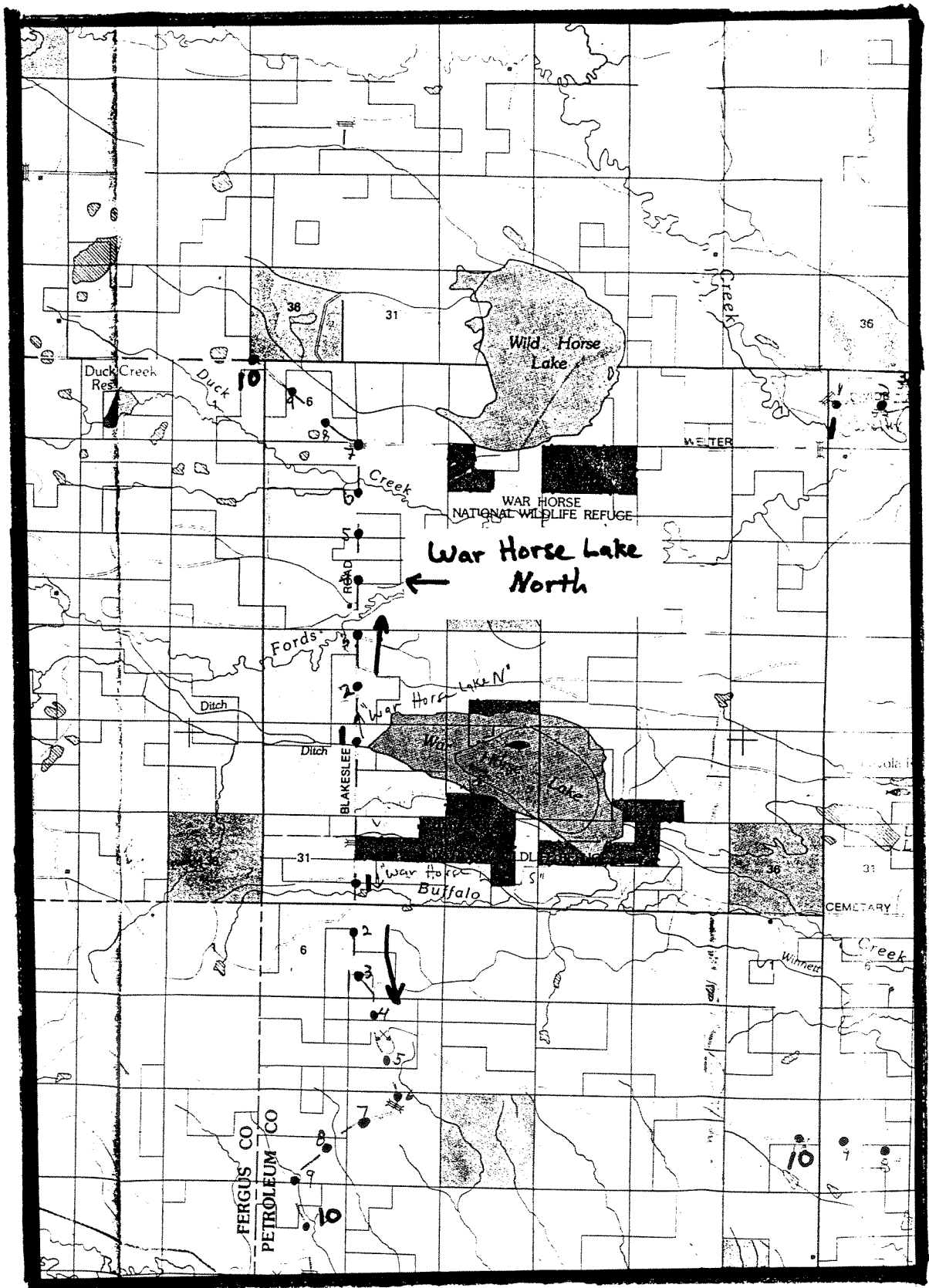
SPECIES	# ROUTES	# POINTS	POINTS/ROUTE	RANGE	SD
Mallard	2	2	1.0	--	--
Northern Harrier	2	2	1.0	--	--
Swainson's Hawk	1	1	1.0	--	--
Red-tailed Hawk	1	1	1.0	--	--
Golden Eagle	1	1	1.0	--	--
American Kestrel	4	8	2.0	1-5	2.0
Ring-necked Pheasant	4	9	2.3	1-4	1.5
Killdeer	12	15	1.3	1-3	0.6
Willet	1	1	1.0	--	--
Upland Sandpiper	14	21	1.5	1-4	0.9
Long-billed Curlew	2	2	1.0	--	--
Common Snipe	1	1	1.0	--	--
Ring-billed Gull	1	1	1.0	--	--
Mourning Dove	14	28	2.0	1-5	1.3
Short-eared Owl	2	2	1.0	--	--
Common Nighthawk	6	10	1.7	1-3	0.8
Northern Flicker	4	4	1.0	--	--
Western Wood-Pewee	4	8	2.0	1-3	1.2
Dusky Flycatcher	2	3	1.5	1-2	--
Say's Phoebe	4	4	1.0	--	--
Eastern Kingbird	6	6	1.0	--	--
Loggerhead Shrike	1	1	1.0	--	--
Pinyon Jay	1	1	1.0	--	--
Black-billed Magpie	1	1	1.0	--	--
Horned Lark	12	43	3.6	1-9	2.2
Cliff Swallow	2	4	2.0	1-3	--
Barn Swallow	4	6	1.5	1-2	0.6
Black-capped Chickadee	3	3	1.0	--	--
Red-breasted Nuthatch	1	1	1.0	--	--
House Wren	6	15	2.5	1-5	1.8
Mountain Bluebird	3	11	3.7	1-7	3.1
American Robin	7	15	2.1	1-4	1.1
Sage Thrasher	2	2	1.0	--	--
European Starling	4	5	1.3	1-2	0.5
Sprague's Pipit	1	1	1.0	--	--
Yellow Warbler	1	1	1.0	--	--
Yellow-rumped Warbler	4	10	2.5	1-6	2.4
Common Yellowthroat	2	3	1.5	1-2	--
Green-tailed Towhee	1	1	1.0	--	--
Spotted Towhee	5	17	3.4	1-7	2.5
Chipping Sparrow	6	25	4.2	1-7	2.6
Clay-colored Sparrow	1	1	1.0	--	--
Brewer's Sparrow	19	62	3.3	1-8	2.0
Vesper Sparrow	23	195	8.5	5-10	1.4
Lark Sparrow	5	15	3.0	1-6	2.3
Lark Bunting	20	139	7.0	1-10	2.9
Savannah Sparrow	5	10	2.0	1-3	1.0
Grasshopper Sparrow	10	22	2.2	1-5	1.2

Table 1 (cont.). Bird species detected on 23 roadside point-count routes in 1998-1999. Total number of point counts was 227 (all routes with 10 points except one with 7 points).

SPECIES	# ROUTES	# POINTS	POINTS/ROUTE	RANGE	SD
Baird's Sparrow	1	1	1.0	--	--
Bobolink	1	1	1.0	--	--
Red-winged Blackbird	8	14	1.8	1-5	1.4
Western Meadowlark	23	221	9.6	7-10	0.8
Brewer's Blackbird	9	12	1.3	1-2	0.5
Common Grackle	1	1	1.0	--	--
Brown-headed Cowbird	16	30	1.9	1-5	1.4
Red Crossbill	2	7	3.5	1-6	--
Pine Siskin	1	2	2.0	1-2	--
American Goldfinch	5	14	2.8	1-6	2.2

The problem of overlooking species during counts applies to all species, even relatively common ones such as Brewer's Sparrow, particularly if counts are conducted only once at each point and the time of the count is not optimal. Increasing the number of points counted will address this problem for the entire study area, but maximizing species richness at particular points (i.e. approaching 100% accuracy in species detections/point) will require multiple visits to points that are spread across the appropriate times of each breeding season. This level of labor-intensive monitoring is probably better applied on a series of plots, where spot-mapping and point counts can be combined with nest searches and nest monitoring (Ralph et al. 1993).

The route descriptions that follow include a map of each route with all points marked (points 1 and 10 are indicated, with an arrow showing direction the route was run). Route descriptions accompany each map and include a legal description of the start and end points of the route, date and time the route was run, an overview of the dominant vegetation on the route, and a list of species and numbers of individuals counted at each point. These are provided for baseline comparison with future counts conducted on each route, and establish a base for a longer-term monitoring scheme in the study area.



ROADSIDE BIRD ROUTE

Name: War Horse Lake North

TRS: start- T16NR25ES30NE **end-** T16NR24ES1NE

Date: 28 May 1998

Time: start- 0720

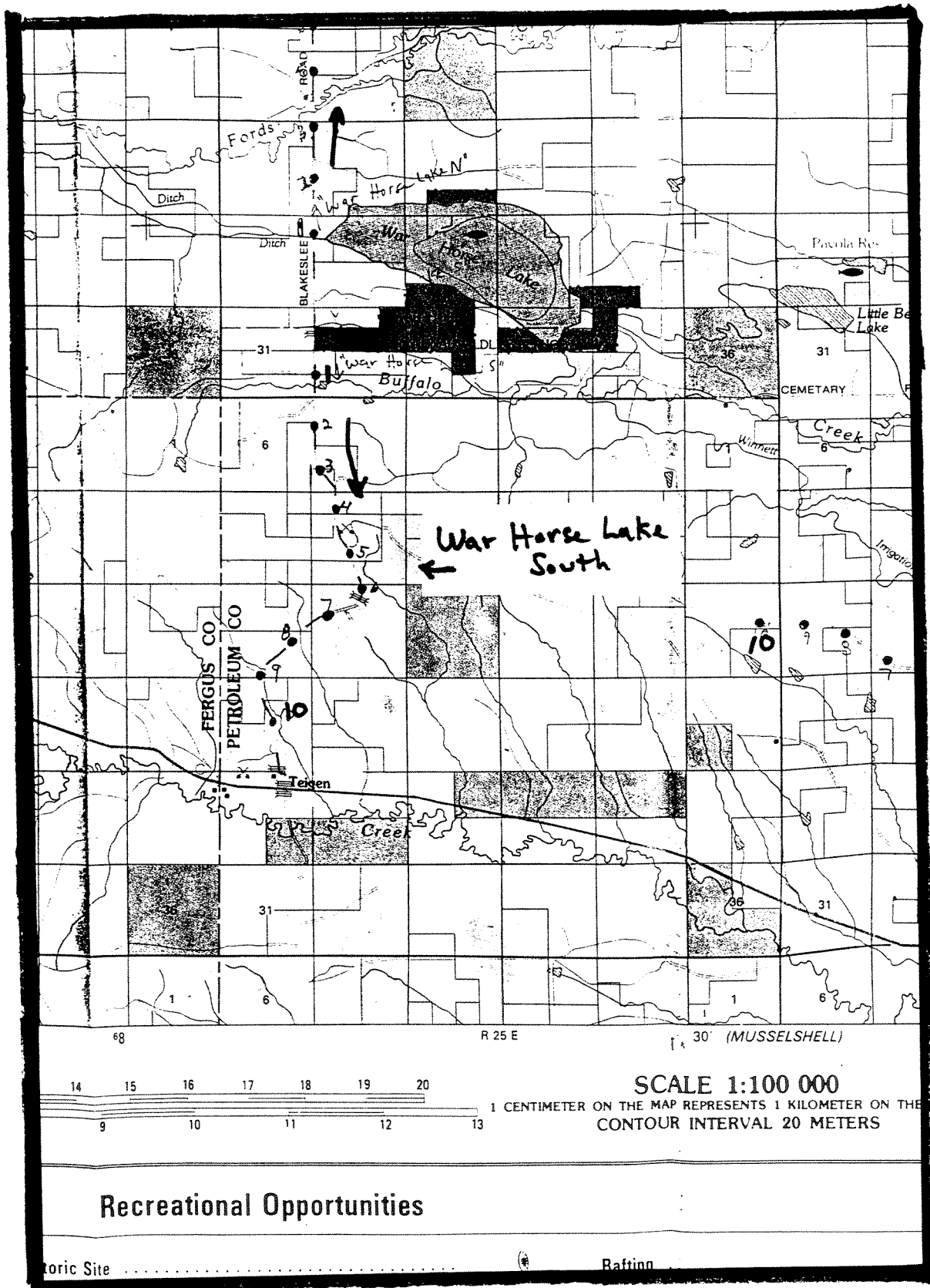
end- 0958

Habitat Description: low stature sagebrush, some dry cropland

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Killdeer	1									
Barn Swallow			3f							
Brewer's Sparrow										1
Vesper Sparrow	3	3		1	2	1	1	1		
Lark Bunting			1	5	4	2	4	6	2	3
Savannah Sparrow					1					
Western Meadowlark	3	3	4	1	1	3	2		2	2

Route Species Richness: 7

Comments: windy



ROADSIDE BIRD ROUTE

Name: War Horse Lake South

TRS: start- T16NR25ES31SE **end-** T15NR25ES19NE

Date: 1 June 1998

Time: start- 0733

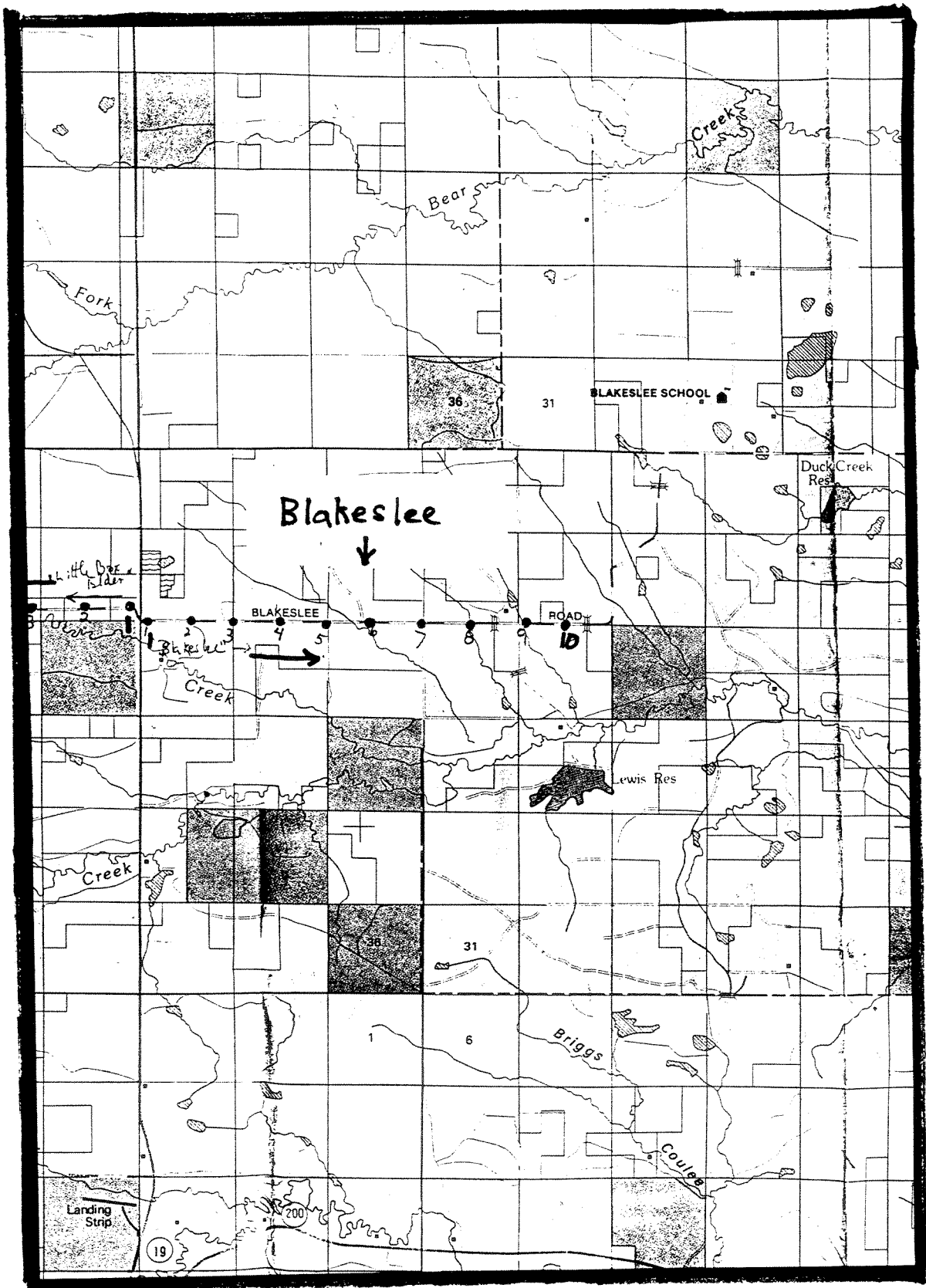
end- 1007

Habitat Description: low stature sagebrush, last two stops with some streamside riparian

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Upland Sandpiper	2									
Black-billed Magpie										1
American Robin	1									1
Spotted Towhee									1	
Vesper Sparrow		2	1	1	2			2	1	1
Lark Bunting						1	1			
Red-wing Blackbird	1									
Western Meadowlark	2	4	4	5	3	3	2	3	4	3
Brewer's Blackbird					1f	1				
Brown-headed Cowbird										3

Route Species Richness: 10

Comments: windy, cloudy



ROADSIDE BIRD ROUTE

Name: Blakeslee

TRS: start- T16NR23ES15NW **end-** T16NR24ES17NE

Date: 1 July 1998

Time: start- 1453

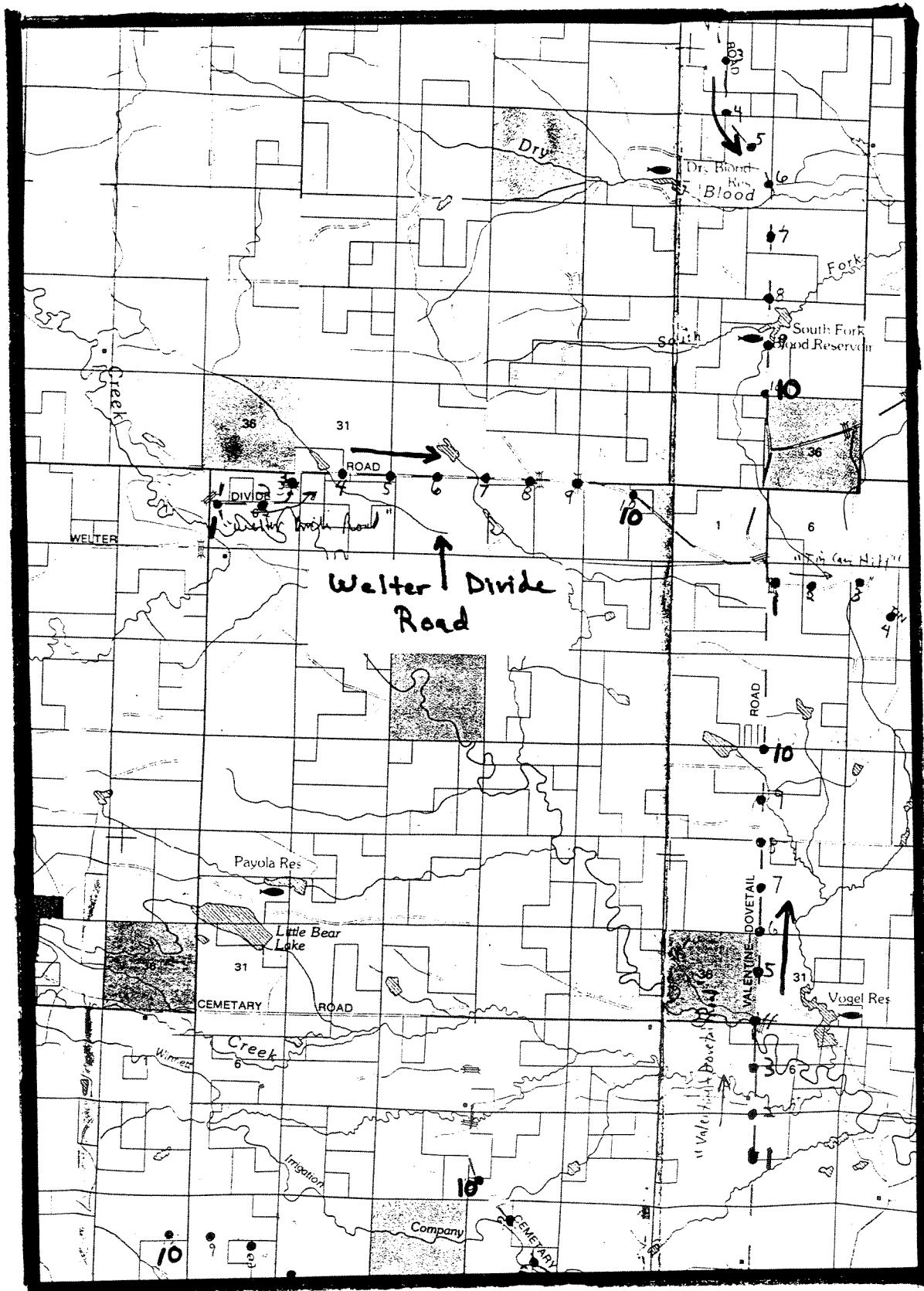
end- 1615

Habitat Description: low stature sagebrush, mixed grassland at stop 4

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Killdeer									1	
Upland Sandpiper							1f	1		
Eastern Kingbird									1	
Sprague's Pipit				1						
Brewer's Sparrow					1		1			
Vesper Sparrow	1	2	3	2	1		1	1	2	1
Lark Bunting	4	7	3	1	4	5	5	2	3	
Savannah Sparrow				1						1
Grasshopper Sparrow										1
Baird's Sparrow						1				
Western Meadowlark	2	2	2	2	1	2	2	2	3	3
Brown-headed Cowbird	1									

Route Species Richness: 12

Comments: windy, cloudy, lots of yellow sweet clover in flower



ROADSIDE BIRD ROUTE

Name: Welter Divide Road

Date: 2 July 1998

Habitat Description: low stature sagebrush, mixed grassland at stops 8 and 9

TRS: start- T16NR26ES6NW

Time: start- 1805

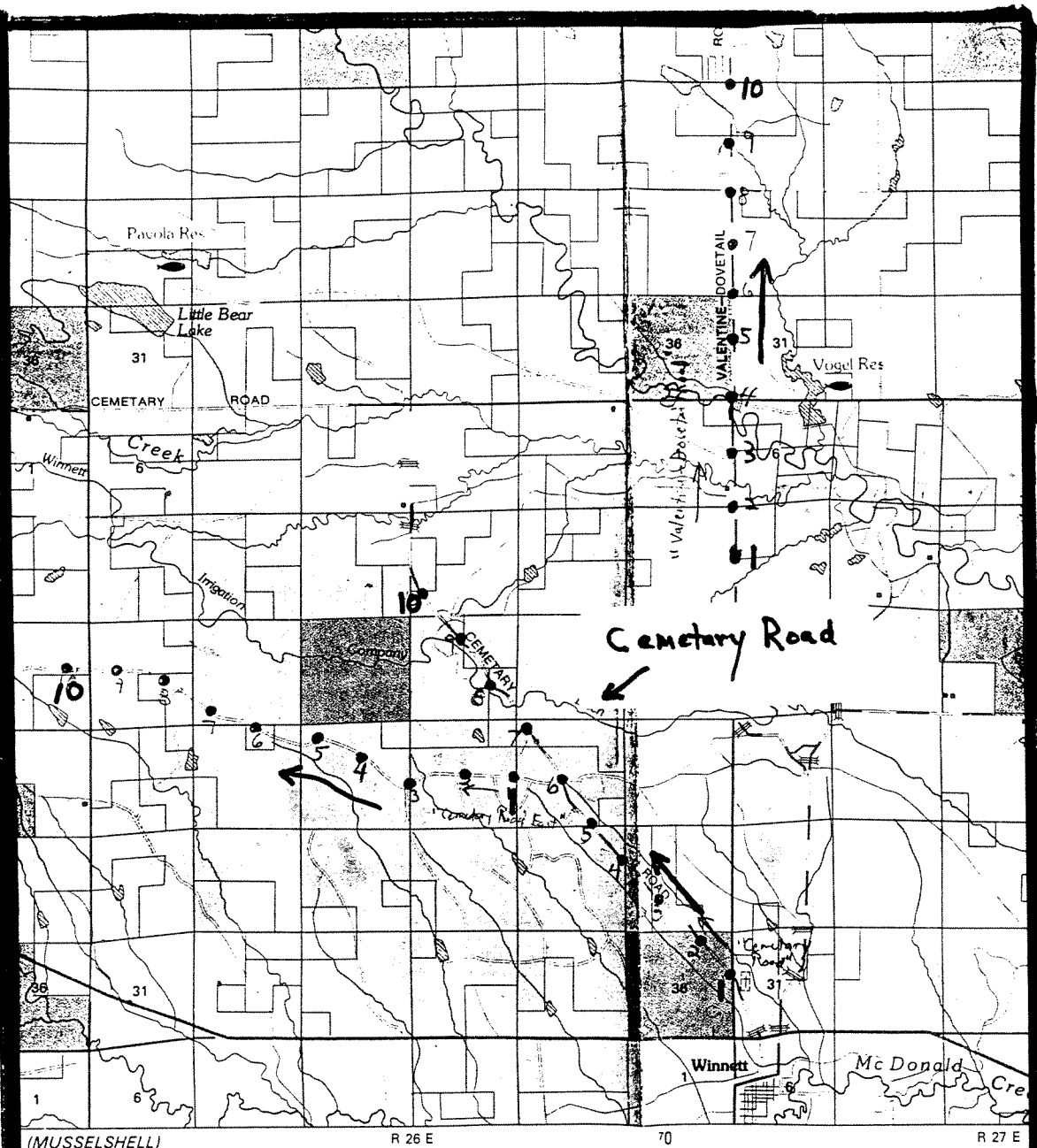
end- T16NR26ES2NE

end- 1924

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Killdeer		1	1					2		
Upland Sandpiper						1		1	2	1
Short-eared Owl						1				
Eastern Kingbird	1									
Horned Lark				1				1		
Common Yellowthroat	1									
Vesper Sparrow	1		2	2	2	1		1	2	1
Lark Sparrow	1									
Lark Bunting	2	4	4	4	4	3	12	1	14	2
Grasshopper Sparrow									1	2
Western Meadowlark	2	2	2	2	3	2	2	4	2	4
Brown-headed Cowbird								3		
American Goldfinch	1f									

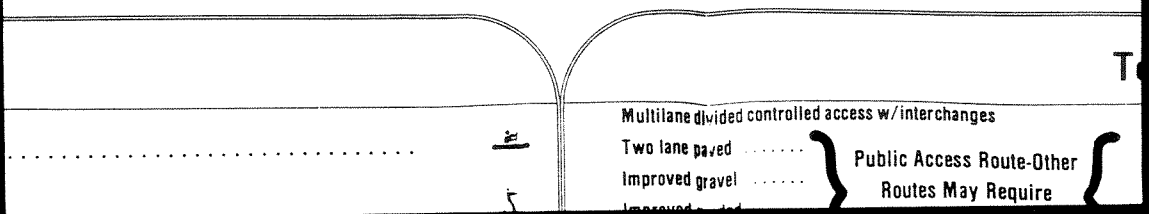
Route Species Richness: 13

Comments: lots of yellow sweet clover in flower



1:100 000

REPRESENTS 1 KILOMETER ON THE GROUND
INTERVAL 20 METERS



ROADSIDE BIRD ROUTE

Name: Cemetary Road

TRS: start- T15NR26ES36NE **end-** T15NR26ES10SW

Date: 2 July 1998

Time: start- 0925

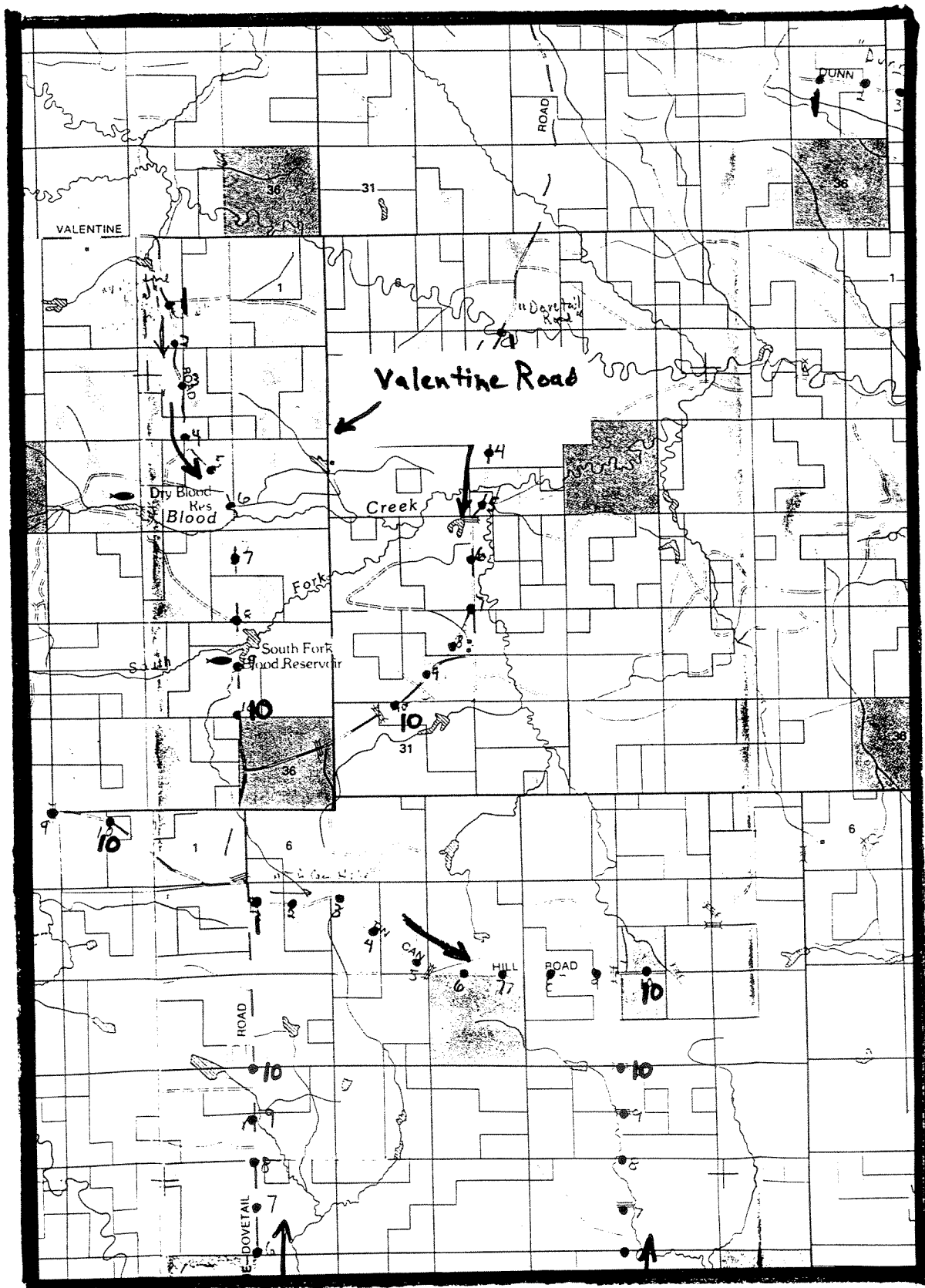
end- 1043

Habitat Description: low stature sagebrush, mixed grassland at stops 9 and 10

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Eastern Kingbird									1	
Horned Lark		1				1				1
Brewer's Sparrow				2	2	1	1			
Vesper Sparrow	3	2	2	1	2	2	2	2	2	2
Lark Bunting	4	3	6	3	2	3	3	3	3	
Western Meadowlark	2	2	2	1	2	1	2	2	2	2
Brown-headed Cowbird									3f	

Route Species Richness: 7

Comments: overcast following early-morning rain



ROADSIDE BIRD ROUTE

Name: Valentine Road

Date: 3 July 1998

Habitat Description: low stature sagebrush; some ponderosa pine savannah at stops 2,3 and 4; marsh at stop 9; some dry agricultural at stops 6 and 7

TRS: start- T17NR26ES2SW

end- T17NR26ES36NW

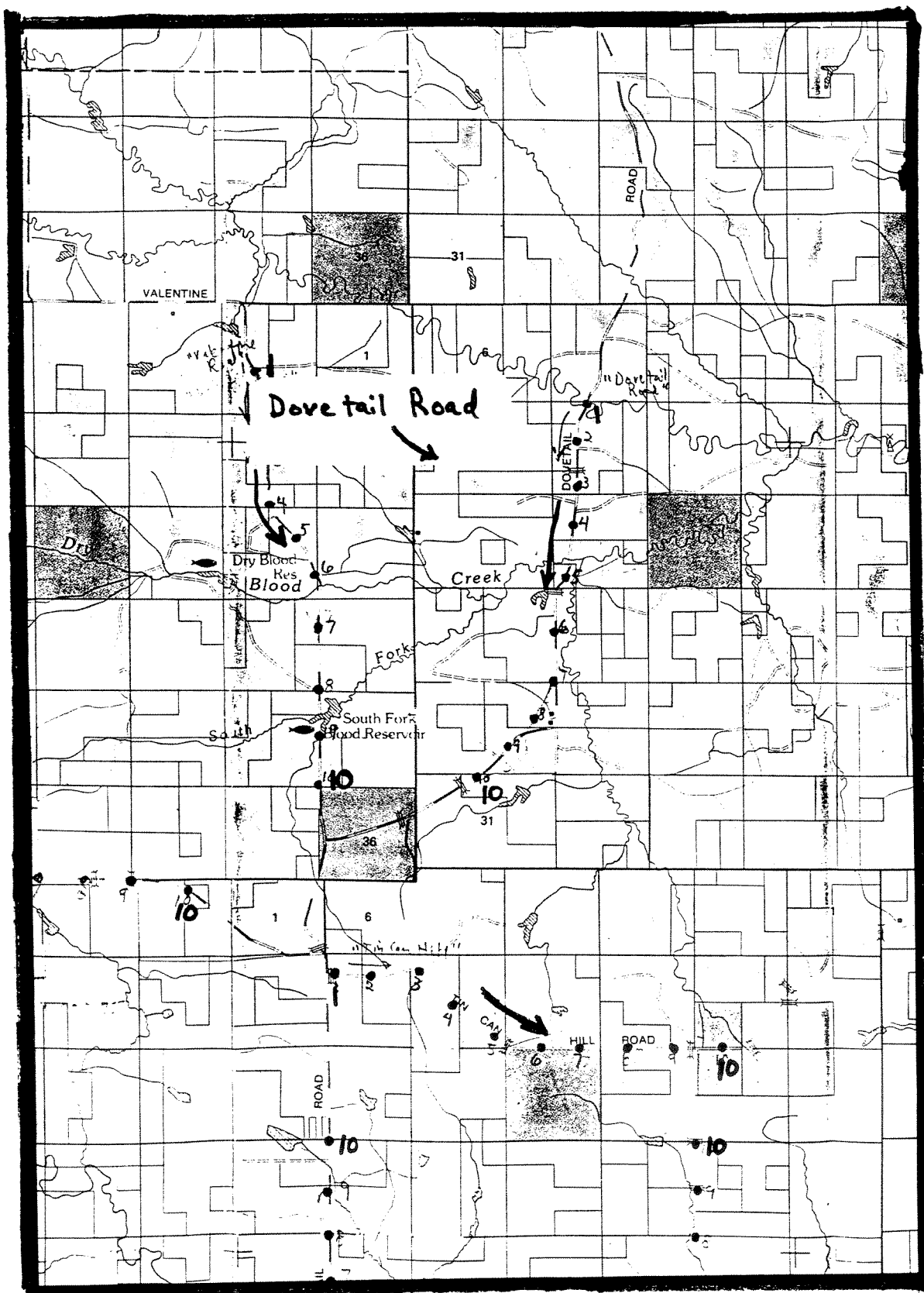
Time: start- 1347

end- 1511

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Golden Eagle									1f	
Killdeer									1	
Mourning Dove		1						1		
Common Nighthawk				1						
Mountain Bluebird			1							
Yellow-rumped Warbler			1							
Green-tailed Towhee				1						
Chipping Sparrow			3	1						
Brewer's Sparrow	1									
Vesper Sparrow	2	2	2	1	2		1	3	1	2
Lark Sparrow			2							
Lark Bunting	1				2	5	4	5	3	3
Red-winged Blackbird						1			1	
Western Meadowlark	2	2	1	2	2	1	2	2	2	3

Route Species Richness: 14

Comments:



ROADSIDE BIRD ROUTE

Name: Dovetail Road

TRS: start- T17NR27ES8NW **end-** T17NR27ES31NW

Date: 3 July 1998

Time: start- 1534

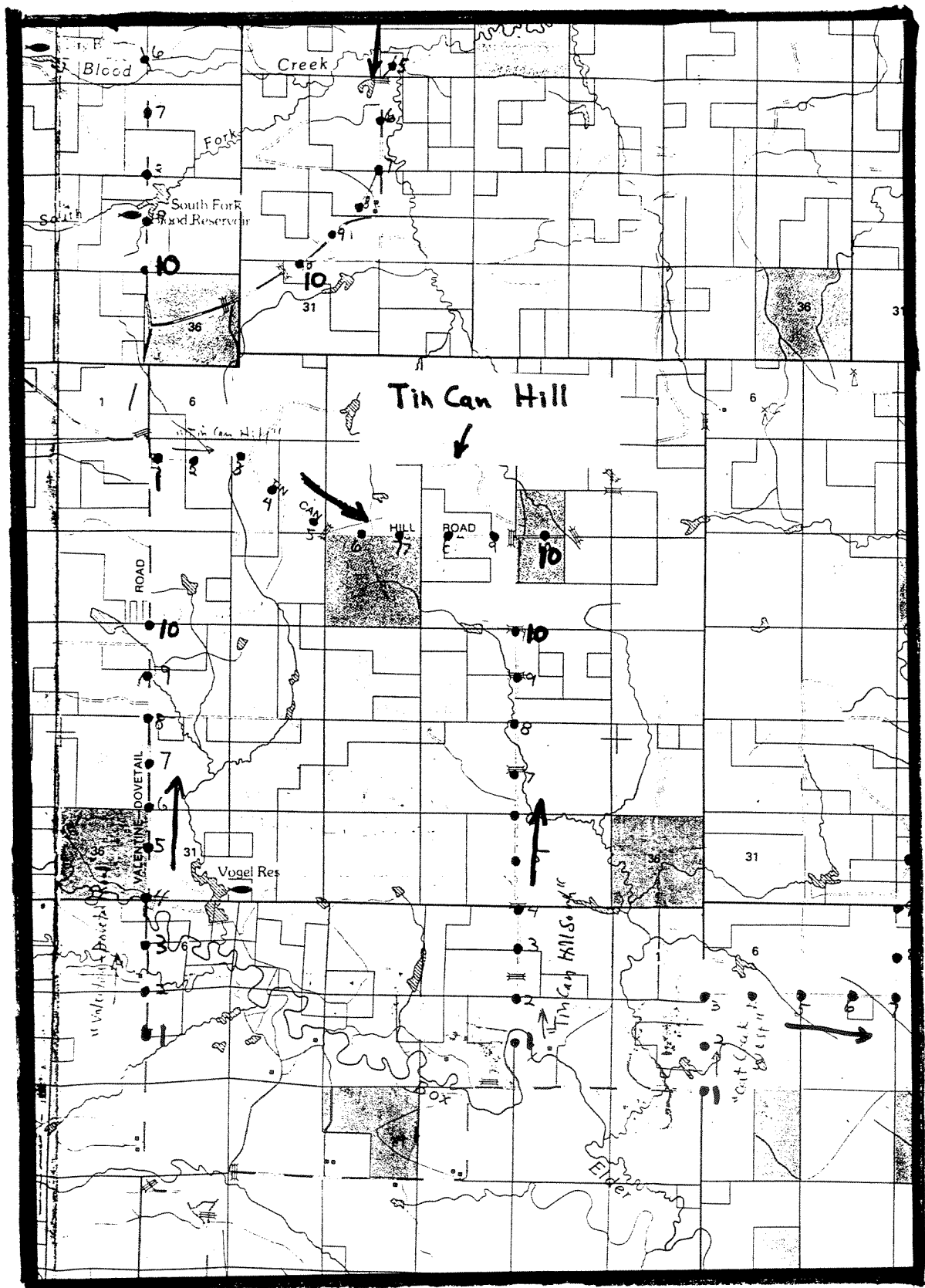
end- 1659

Habitat Description: low stature sagebrush; some dry agricultural at stops 2, 6 and 7; mixed grassland at stop 8

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Upland Sandpiper							1			
Mourning Dove							1f			
Horned Lark		1		1	1			1		
Brewer's Sparrow										2
Vesper Sparrow	2	1	2		2				1	2
Lark Bunting	3	3	3	4	4	3	2	3	6	3
Grasshopper Sparrow		1			1					
Red-winged Blackbird							3			
Western Meadowlark	3	2	1	3	3	3	2	4	2	2

Route Species Richness: 9

Comments: windy



ROADSIDE BIRD ROUTE

Name: Tin Can Hill

TRS: start- T16NR27ES7NW

end- T16NR27ES11SW

Date: 3 July 1998

Time: start- 1720

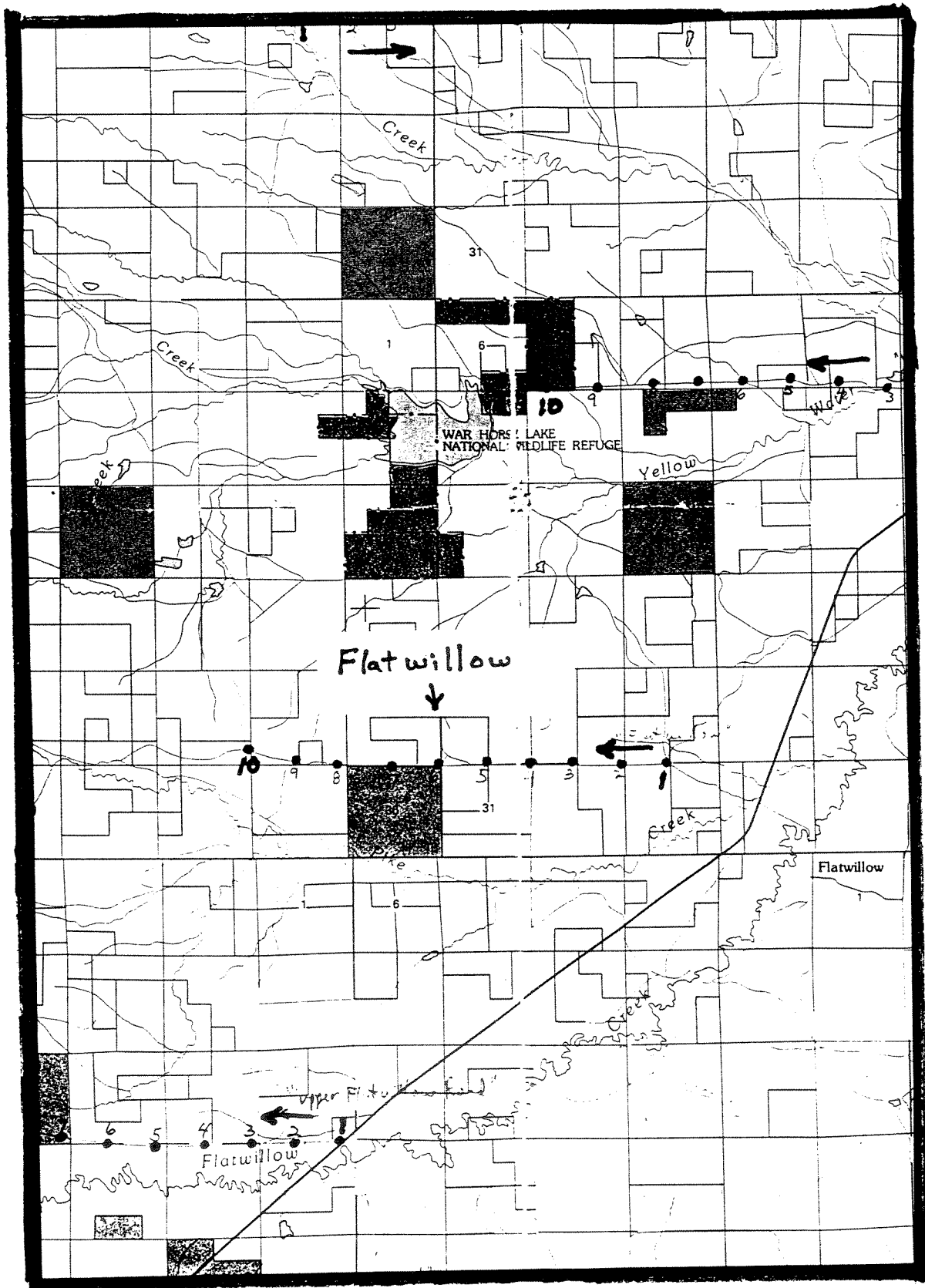
end- 1833

Habitat Description: low stature sagebrush; some mixed grassland at stop 6

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Mallard							2f			
Northern Harrier						1f				
Swainson's Hawk		1f								
Upland Sandpiper						1				
Horned Lark				1						
Brewer's Sparrow					2				1	
Vesper Sparrow	1	1	2	2	1		3	2	1	1
Lark Bunting	3	1	3	2	3	5	6	1	5	4
Grasshopper Sparrow						1				
Western Meadowlark	2	1	1	1	1	1	1	2	2	2
Brown-headed Cowbird								2	4	

Route Species Richness: 11

Comments: windy; cattle at stops 8 and 9



ROADSIDE BIRD ROUTE

Name: Flatwillow

TRS: start- T12NR25ES26SW **end-** T12NR26ES29NE

Date: 4 July 1998

Time: start- 0653

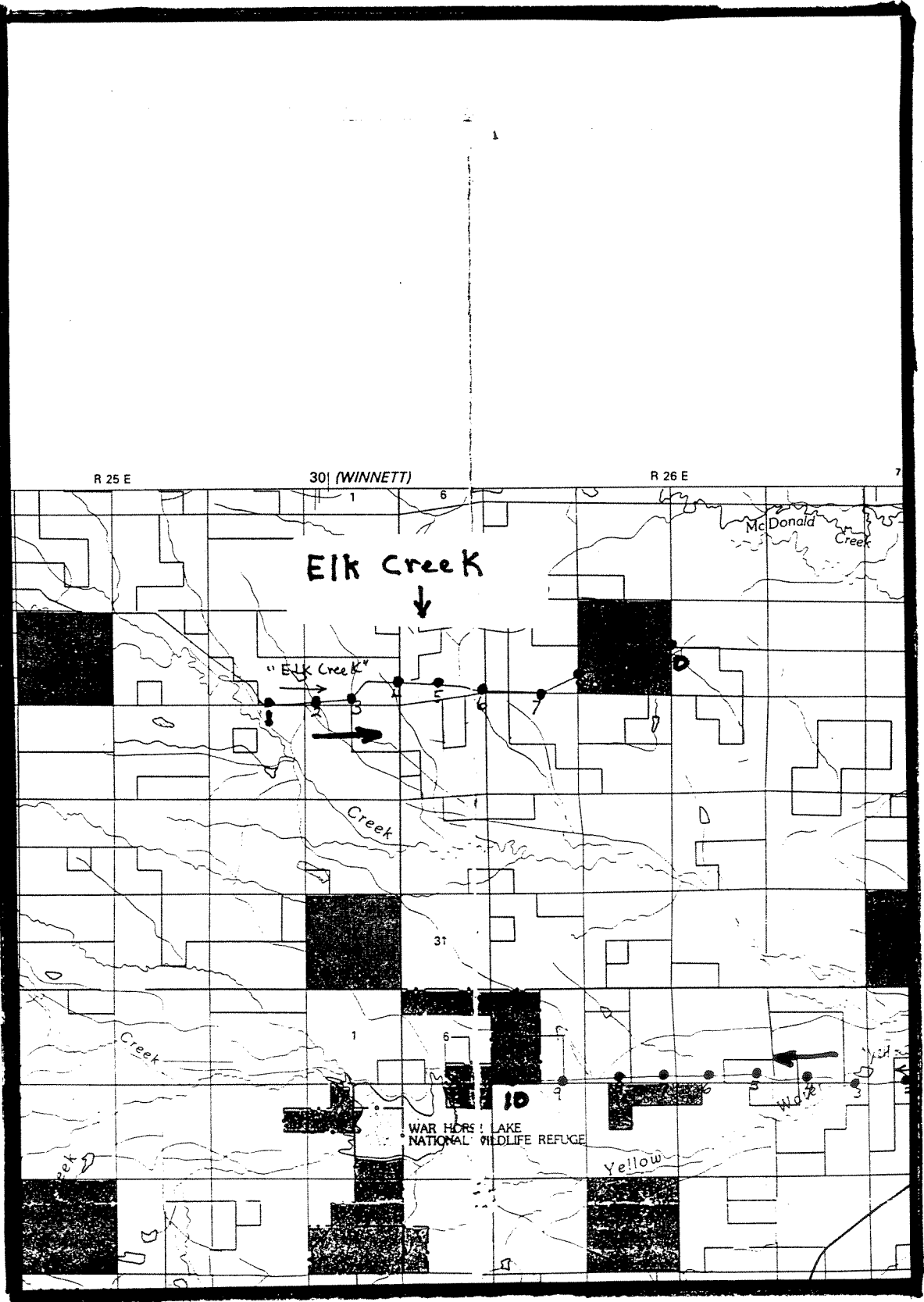
end- 0817

Habitat Description: low stature sagebrush; mixed grassland at stops 1 and 3; some CRP at stop 5

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Long-billed Curlew	1									
Mourning Dove									1	
Short-eared Owl							1			
Horned Lark	2									
Barn Swallow		2f		1f						
Brewer's Sparrow				2	3		2	1	3	2
Vesper Sparrow	2	2	2	3	5	4	2	4	2	3
Lark Bunting	3	3	2							
Grasshopper Sparrow	1	2	2							
Western Meadowlark	3	2	2	3	3	3	1	2	2	3

Route Species Richness: 10

Comments:



ROADSIDE BIRD ROUTE

Name: Elk Creek

Date: 4 July 1998

Habitat Description: low stature sagebrush; mixed grassland at stop 7; some streamside riparian at stops 1 and 2; lots of saltbush and standing water at stop 10

TRS: start- T14NR25ES14SE **end-** T14NR26ES15SW

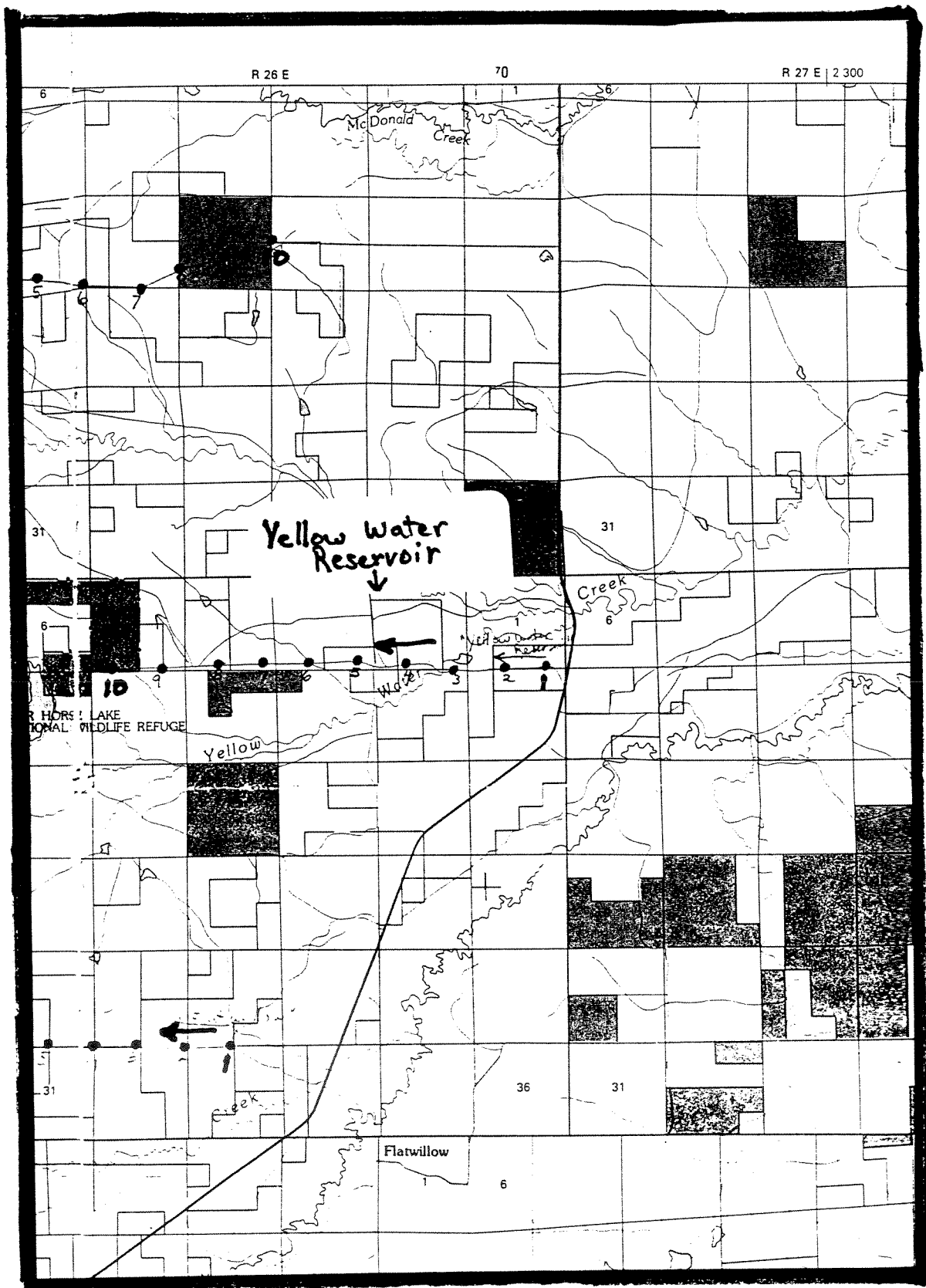
Time: start- 0938

end- 1053

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Mallard		1f								
American Kestrel			1							
Ring-necked Pheasant	1									
Killdeer	1									
Black-capped Chickadee	1									
Clay-colored Sparrow	1									
Brewer's Sparrow				2		2	1	1		1
Vesper Sparrow	3	1	3	3	2	4	6	3	1	1
Lark Bunting	3	1	2	2	5	1		1	3	2
Red-winged Blackbird		1								3
Western Meadowlark	3	2	3	2	2	2	2	3	4	2
Brewer's Blackbird					1					
Brown-headed Cowbird	6									1

Route Species Richness: 13

Comments:



ROADSIDE BIRD ROUTE

Name: Yellow Water Reservoir

TRS: start- T13NR26ES1SE

end- T13NR26ES5SW

Date: 4 July 1998

Time: start- 1419

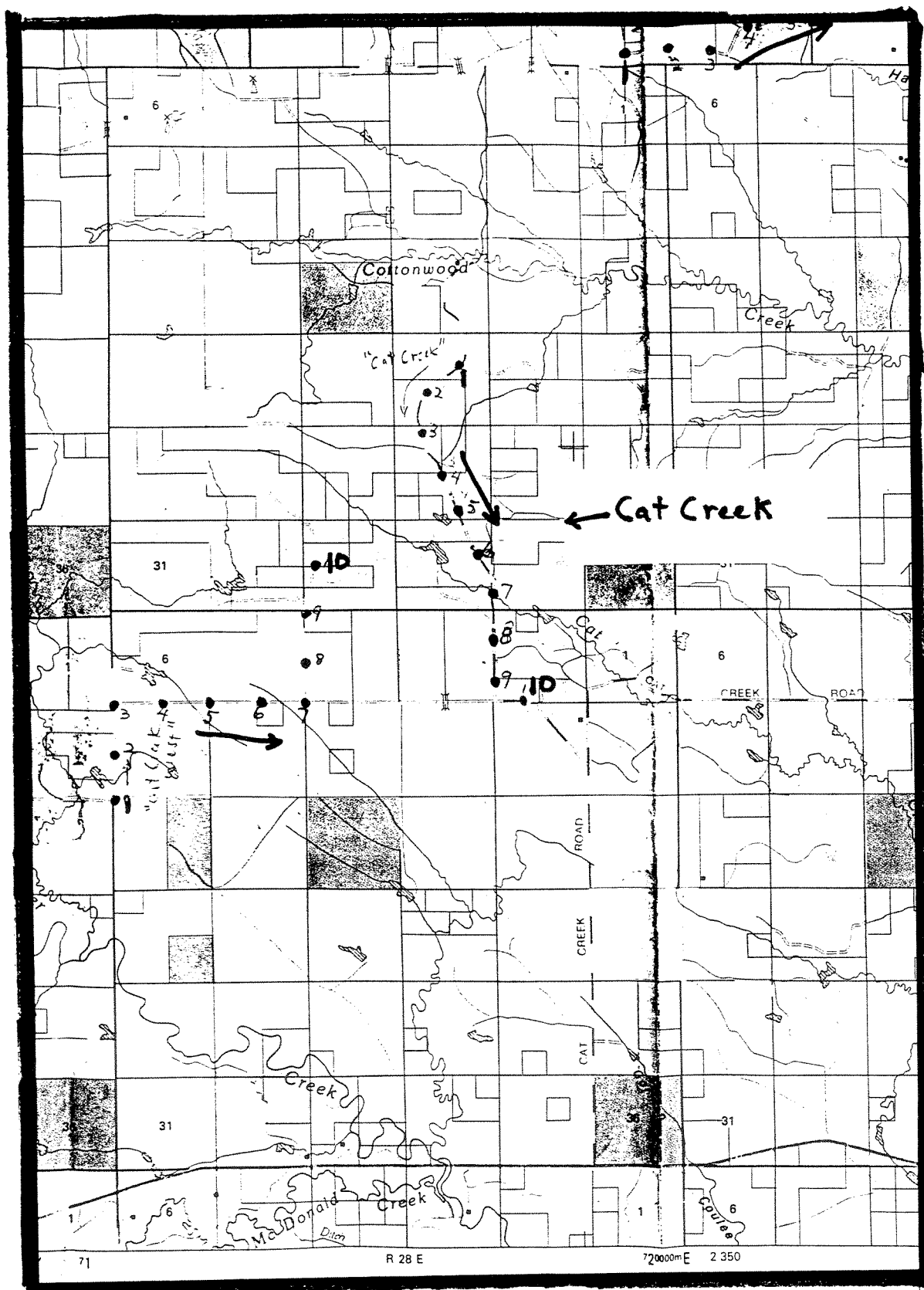
end- 1532

Habitat Description: low stature sagebrush; some mixed grassland at stop 2; some dry cropland at stop 3; 5 cottonwood trees near stop 7

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Killdeer							1			
Upland Sandpiper			1							
Mourning Dove	2		1							
Common Nighthawk										1f
Loggerhead Shrike							1			
Brewer's Sparrow	2	1		1		2	1	1	1	1
Vesper Sparrow	2	2	2	2	2	1	1	2	2	2
Lark Bunting	4	3	1	2	1	3	3	6	4	3
Red-winged Blackbird			2							
Western Meadowlark	3	1	1	3		2	2	2	2	2
Brown-headed Cowbird					1					

Route Species Richness: 11

Comments: cattle at stop 5



ROADSIDE BIRD ROUTE

Name: Cat Creek

TRS: start- T16NR28ES22NE **end-** T15NR28ES2SW

Date: 4 July 1998

Time: start- 1638

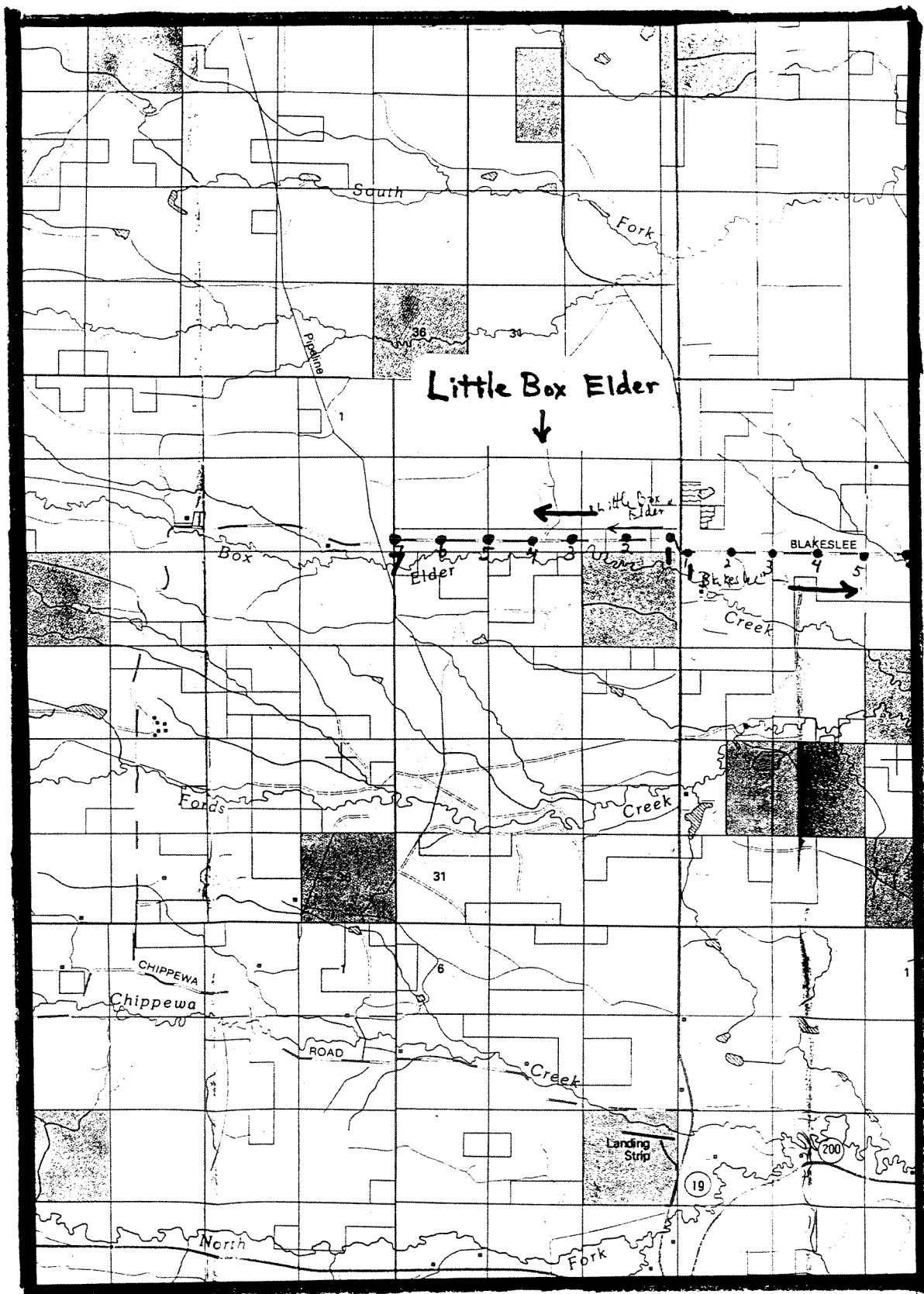
end- 1746

Habitat Description: low stature sagebrush; some ponderosa pine savannah at stops 1, 2 and 3; some dry cropland or rangeland at stops 8, 9 and 10; mixed grassland at stop 9

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Killdeer							1			
Long-billed Curlew									15	
Mourning Dove					1					
Common Nighthawk			1f							
Pinyon Jay	3									
Horned Lark				1				1	3	3
House Wren			1							
American Robin	1									
Yellow-rumped Warbler			1							
Chipping Sparrow	1	1	1							
Brewer's Sparrow			1	1	2			2		
Vesper Sparrow	2	3	3	3	3	2	1	2	2	1
Lark Bunting				2	3	4	4	3		
Grasshopper Sparrow							1			1
Western Meadowlark	1			1	2	2	3	3	2	6

Route Species Richness: 15

Comments:



ROADSIDE BIRD ROUTE

Name: Little Box Elder

TRS: start- T16NR23ES9SE

end- T16NR23ES7SW

Date: 4 July 1998

Time: start- 0734

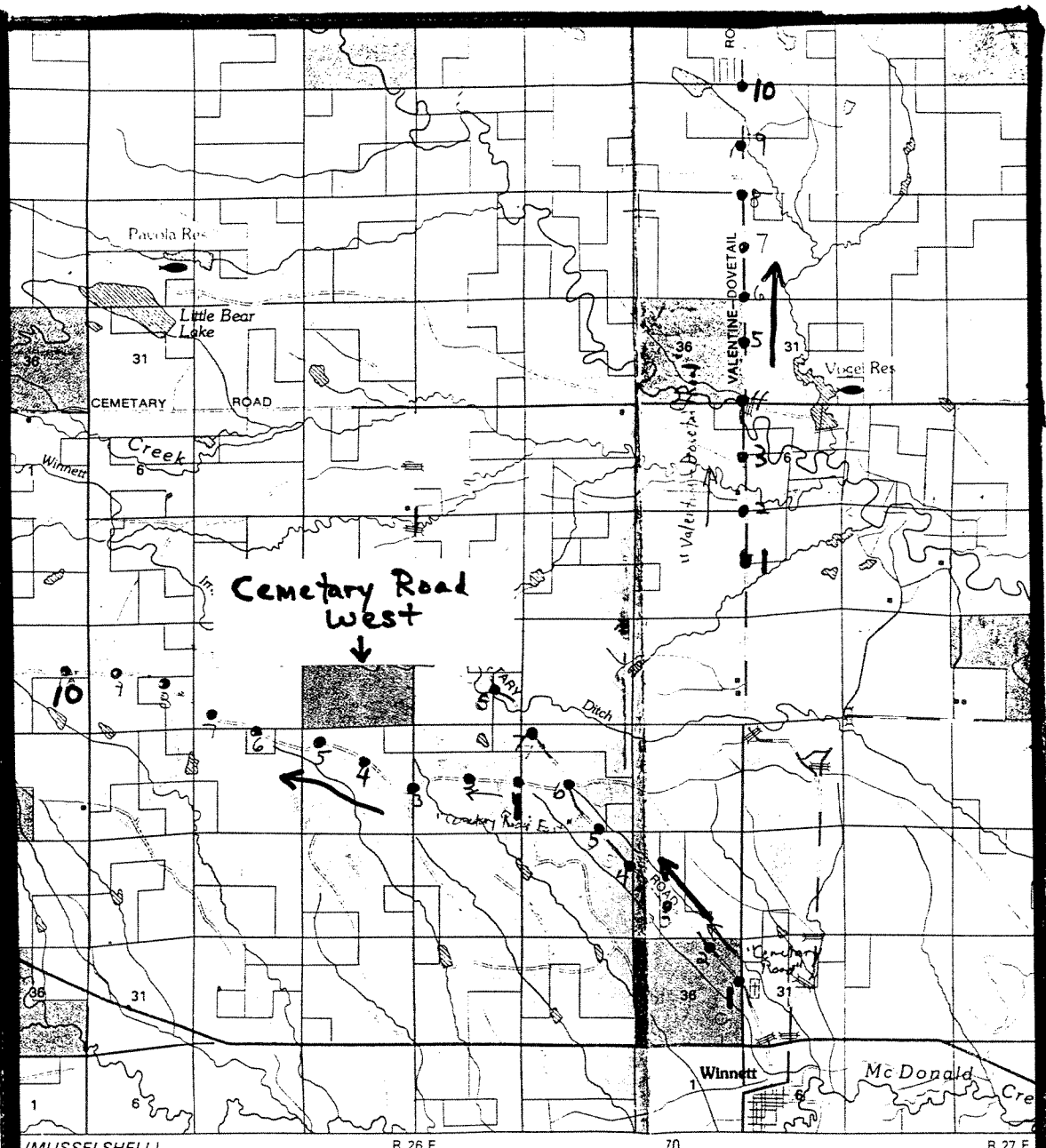
end- 0824

Habitat Description: low stature sagebrush; some mixed grassland and pasture at stop 7

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Killdeer							2			
Upland Sandpiper	1									
Horned Lark			1	1						
Brewer's Sparrow	1	1	2	1						
Vesper Sparrow	2	1	2		1		1			
Lark Bunting	3	5	3	5	2	1	3			
Savannah Sparrow					5	1	1			
Grasshopper Sparrow					2	2				
Western Meadowlark	3	1	2	3	3	3	5			
Brown-headed Cowbird			2				1			

Route Species Richness: 10

Comments: only 7 stops before private land



(MUSSELSHELL)

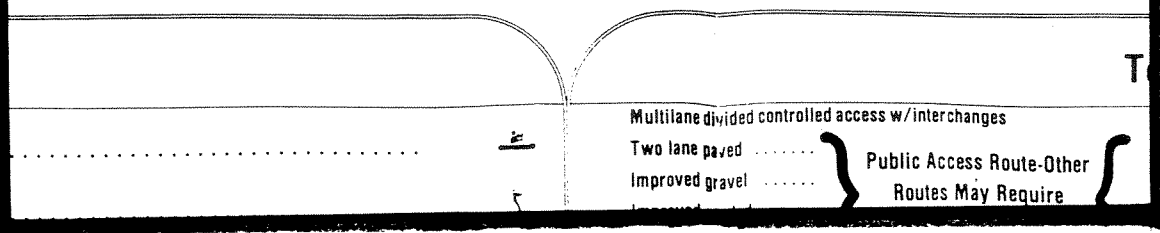
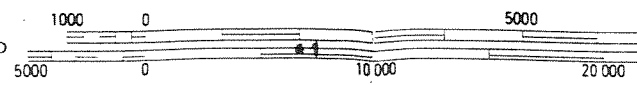
R 26 E

70

R 27 E

1:100 000

SENTS 1 KILOMETER ON THE GROUND
RVAL 20 METERS



ROADSIDE BIRD ROUTE

Name: Cemetary Road West

TRS: start- T15NR26ES22SE **end-** T15NR25ES13NE

Date: 18 June 1999

Time: start- 0637

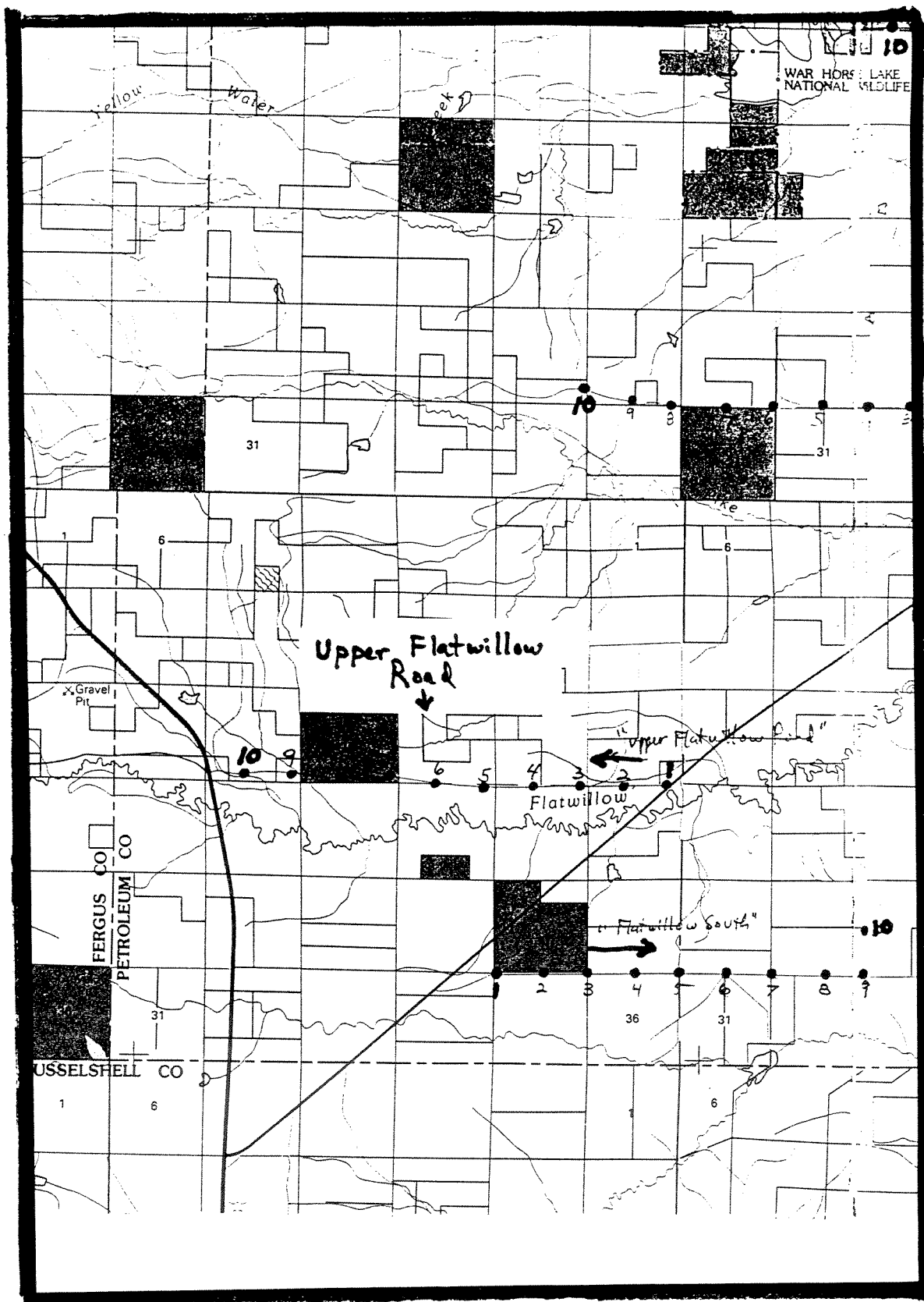
end- 0829

Habitat Description: low stature sagebrush; some mixed grassland at stops 3 and 7

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Northern Harrier				1f						
Upland Sandpiper		1								2
Mourning Dove		2								
Common Nighthawk										1f
Say's Phoebe					1					
Horned Lark							2	1	3	
Sage Thrasher	1									
Brewer's Sparrow	3	2	3	6	2	1				
Vesper Sparrow	2	1	3	1	1		2	2	4	2
Lark Bunting		2	3	2						
Western Meadowlark	5	5	6	6	4	5	5	5	5	5
Brewer's Blackbird						4				
Brown-headed Cowbird					1					

Route Species Richness: 13

Comments:



ROADSIDE BIRD ROUTE

Name: Upper Flatwillow Road

Date: 18 June 1999

TRS: start- T12NR25ES13SE end- T12NR25ES17SW

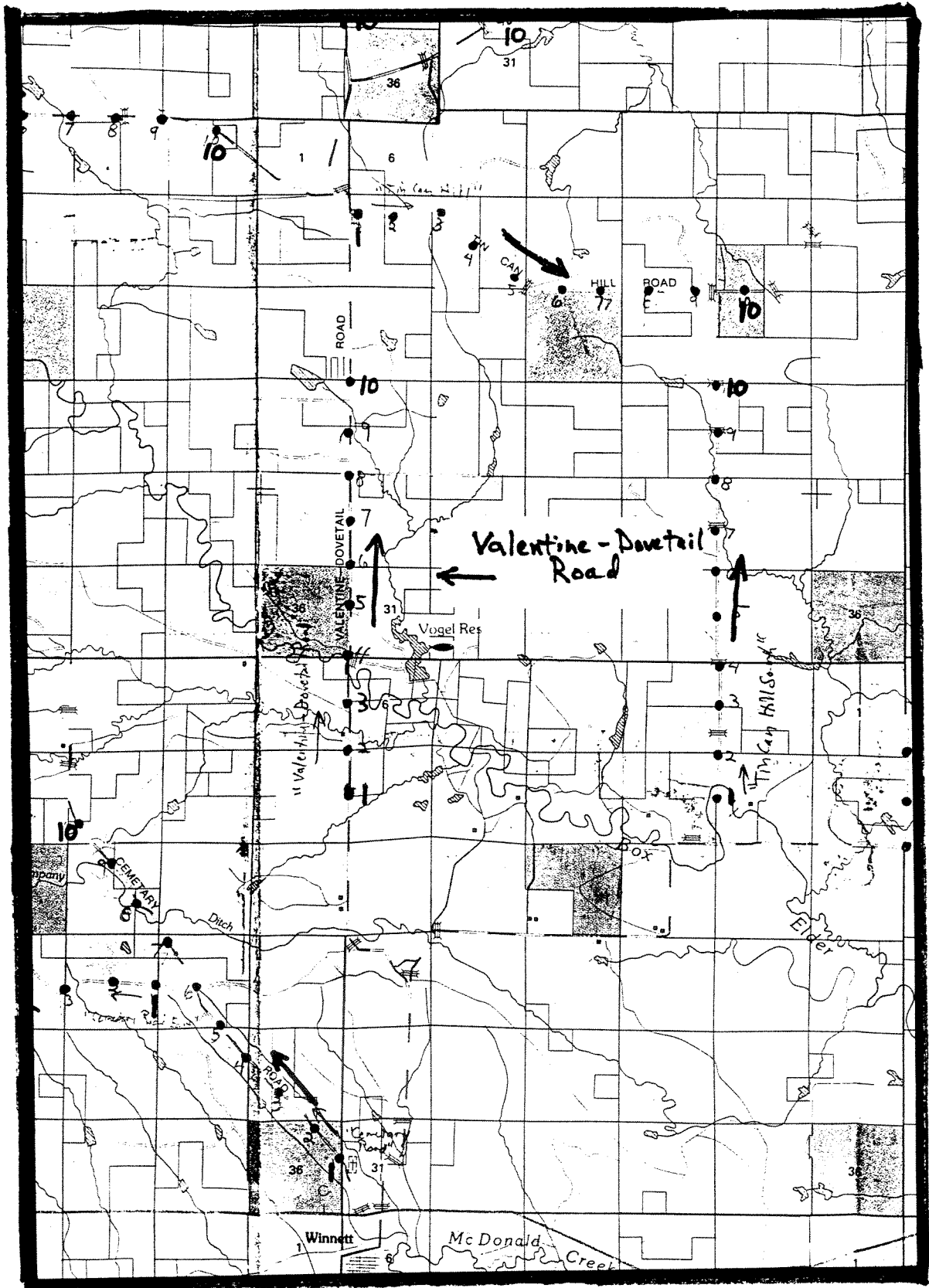
Time: start- 0921

end- 1030

Habitat Description: low stature sagebrush; irrigated agricultural at stops 1, 2, 6, 8, 9; streamside riparian at stop 10; some mixed grassland at stops 4, 5 and 7

[illegible]**Route Species Richness: 21**

Comments:



ROADSIDE BIRD ROUTE

Name: Valentine-Dovetail Road

Date: 19 June 1999

Habitat Description: low stature sagebrush; agricultural at stops 1, 2, 3; streamside riparian at stop 4; mixed grassland at stops 1 and 10

TRS: start- T15NR26ES12NE **end-** T16NR26ES13SE

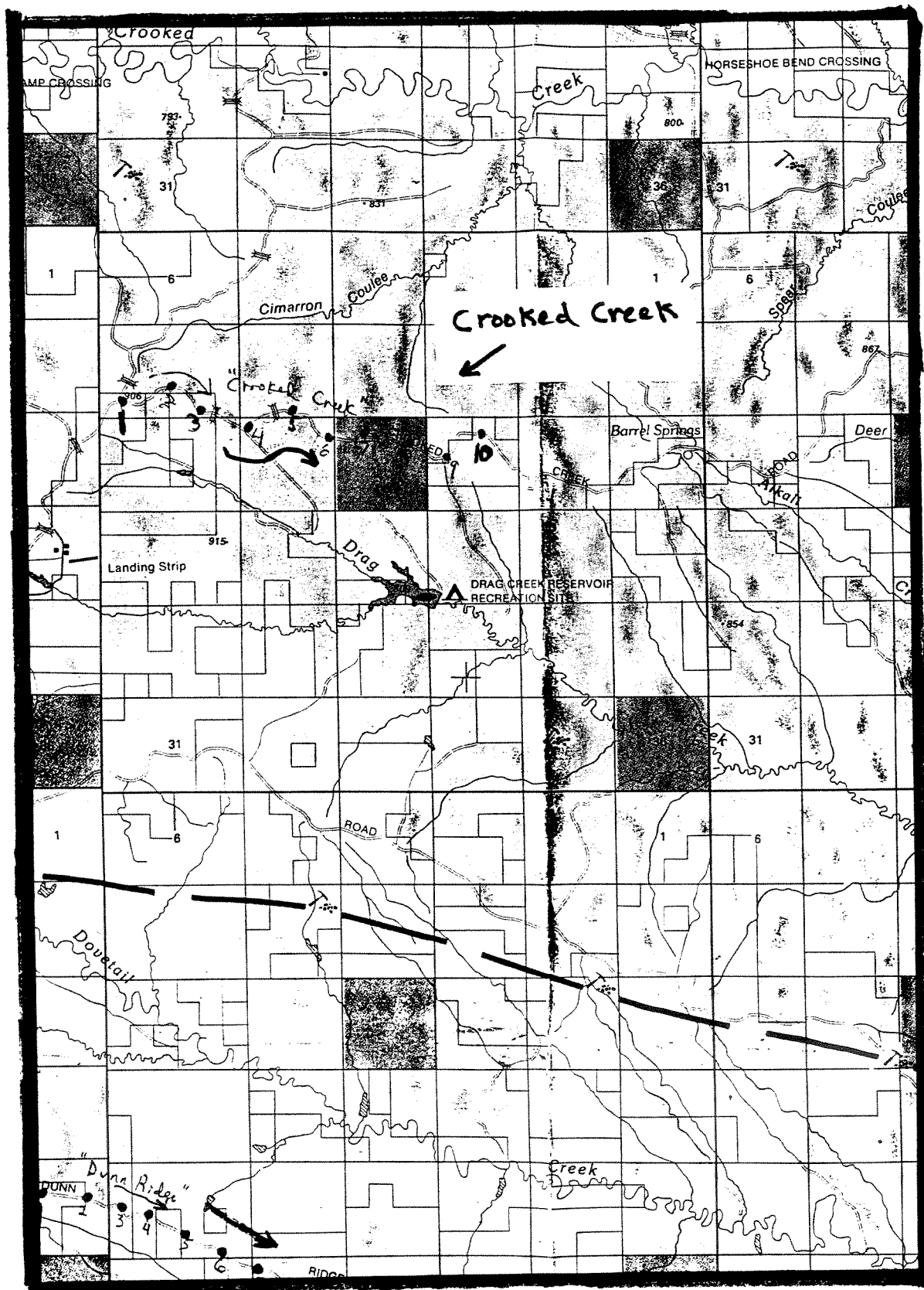
Time: start- 0642

end- 0813

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Red-tailed Hawk	1									
American Kestrel	1		1f			1	1		1	
Ring-necked Pheasant	2	1	2	1						
Killdeer	1f									1
Upland Sandpiper				1						
Mourning Dove		1	1	1	1					
Northern Flicker			1							
Eastern Kingbird				1						
Horned Lark						2				
Cliff Swallow		25	1f	60						
Barn Swallow									1	1f
American Robin				1						
European Starling			2	2						
Brewer's Sparrow				1	2		1			
Vesper Sparrow	2		1	1	4	1		2	2	1
Lark Bunting	2	1					1	1	1	1
Grasshopper Sparrow	1									
Red-winged Blackbird									1	
Western Meadowlark	5	6	5	5	5	3	5	5	4	5
Brown-headed Cowbird				1			7			

Route Species Richness: 20

Comments: cattle at stop 7



ROADSIDE BIRD ROUTE

Name: Crooked Creek

Date: 19 June 1999

Habitat Description: low stature sagebrush and ponderosa pine savannah at every stop or nearby

TRS: start- T19NR28ES7SW

end- T19NR28ES15NE

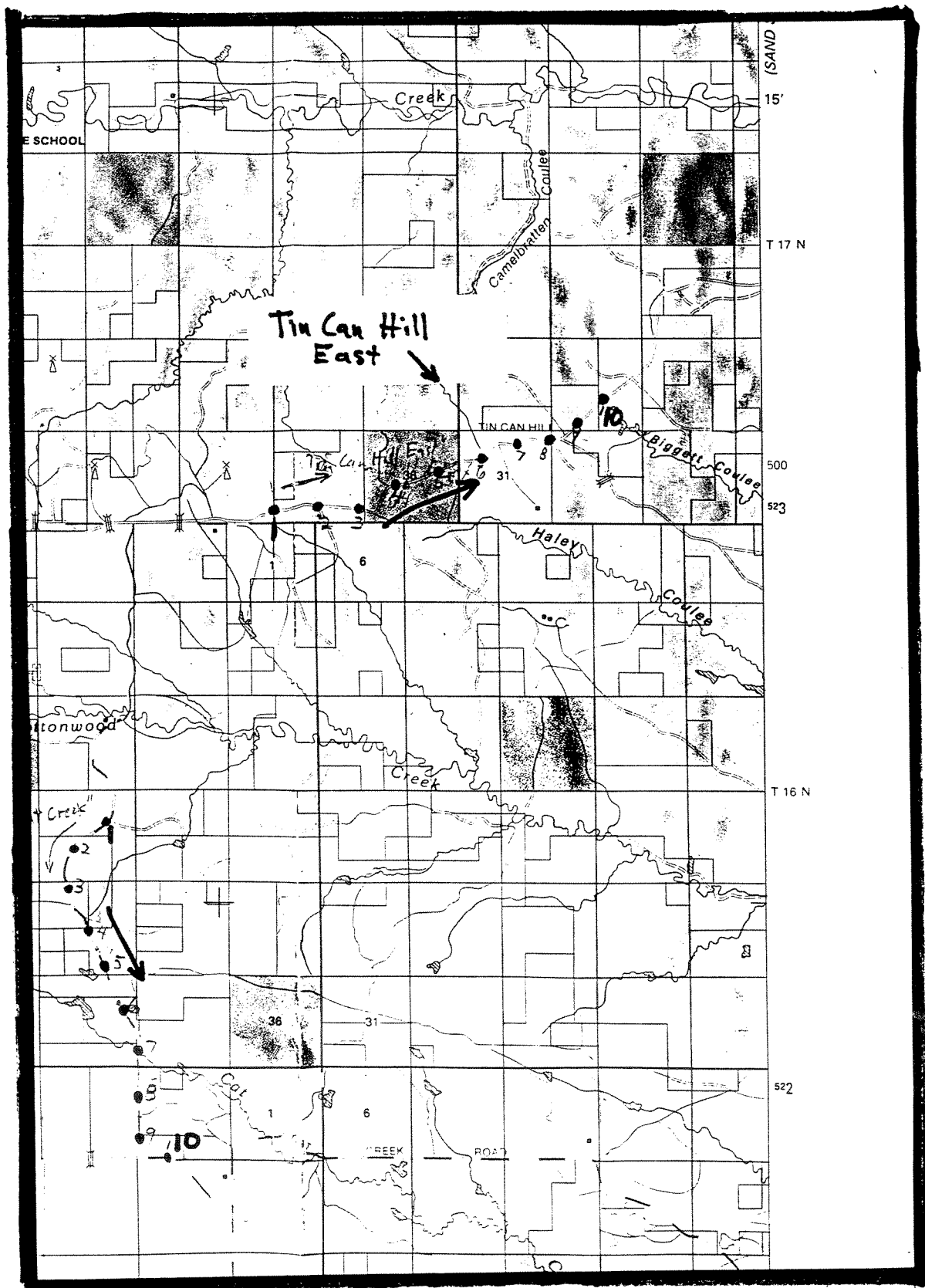
Time: start- 0857

end- 1005

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Upland Sandpiper			1			1				
Mourning Dove		1				1	1			
Common Nighthawk			1f					1f		
Northern Flicker					1					
Western Wood-Pewee				1			1			1
Black-capped Chickadee				1						
House Wren	1			1				1	1	1
American Robin	1	2	1	1						
European Starling					1					
Spotted Towhee		1		1			1		1	
Chipping Sparrow		1	1	1	1		1	1	1	
Vesper Sparrow	3	2	2			1		2	1	3
Lark Sparrow				1						1
Western Meadowlark	6	6	7	4	6	7	3	3	5	4
Brewer's Blackbird	1	3								
American Goldfinch			1f	1f	1	1				

Route Species Richness: 16

Comments:



ROADSIDE BIRD ROUTE

Name: Tin Can Hill East

TRS: start- T17NR28ES35SW **end-** T17NR29ES29SE

Date: 20 June 1999

Time: start- 1042

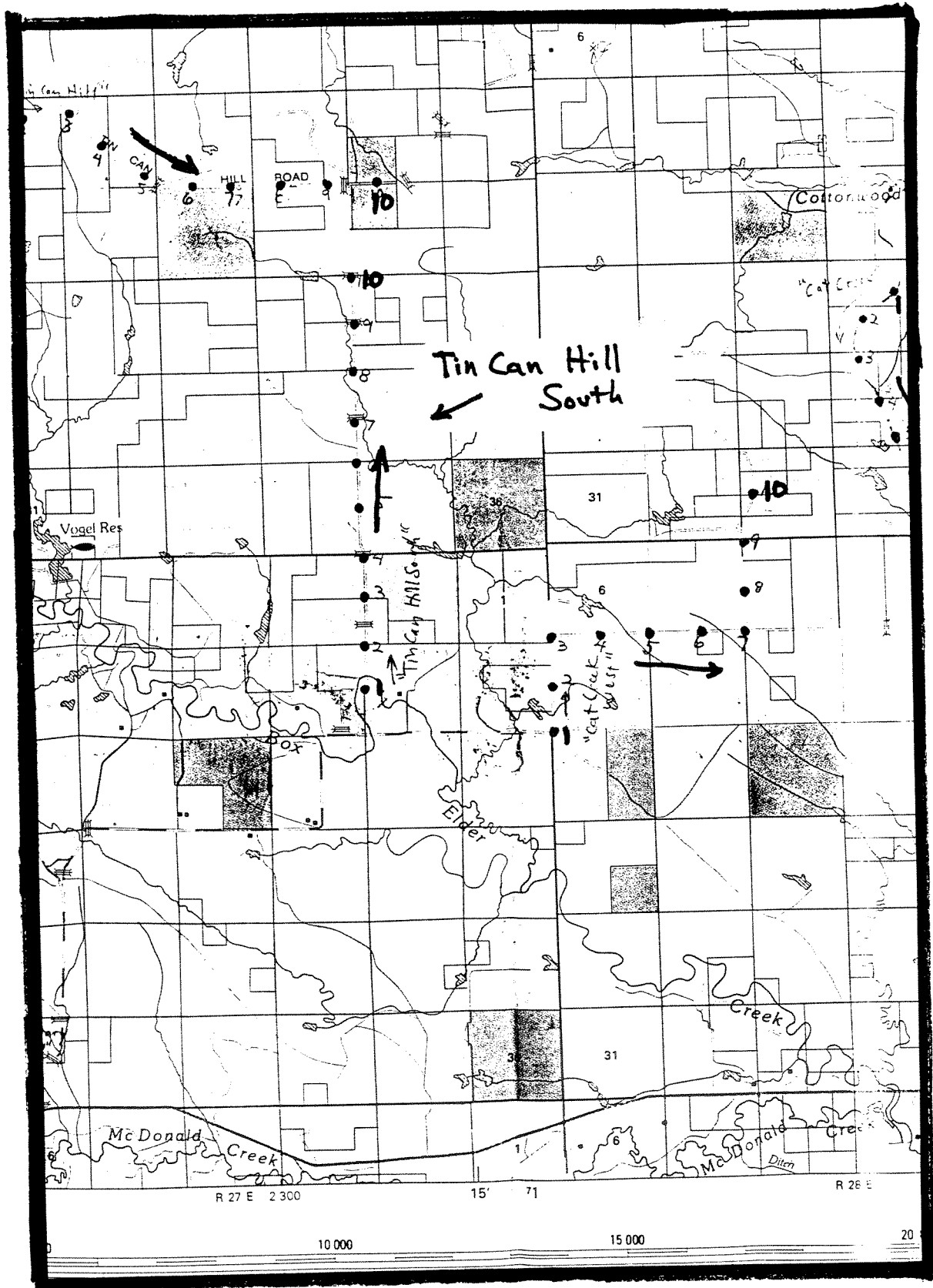
end- 1141

Habitat Description: low stature sagebrush; ponderosa pine savannah at stops 1, 2, 3, 6, 7 and 10

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Mourning Dove		2								
Common Nighthawk						1f			1f	1f
Western Wood-Pewee							1			
Dusky Flycatcher	1									
Say's Phoebe							1			
Cliff Swallow								4f		
Red-breasted Nuthatch		1								
House Wren	1	1								1
Mountain Bluebird		1				1				2
American Robin			1	1			1			
Yellow-rumped Warbler	1						1			
Spotted Towhee		1	1			1				1
Chipping Sparrow	2		1			2	1			1
Brewer's Sparrow								3	3	
Vesper Sparrow	2	4	2	6	4			3	4	2
Lark Sparrow	1				2	2	1			1
Western Meadowlark		1	3	5	2	1	2	4	3	1
Brewer's Blackbird				1						
Brown-headed Cowbird	1									
American Goldfinch										2

Route Species Richness: 20

Comments:



ROADSIDE BIRD ROUTE

Name: Tin Can Hill South

Date: 20 June 1999

Habitat Description: low stature sagebrush; crested wheatgrass at stops 1, 2, 9 and 10; some dry cropland at stops 1, 2, 7, 8 and 9

TRS: start- T15NR27ES10NE **end-** T16NR27ES23NW

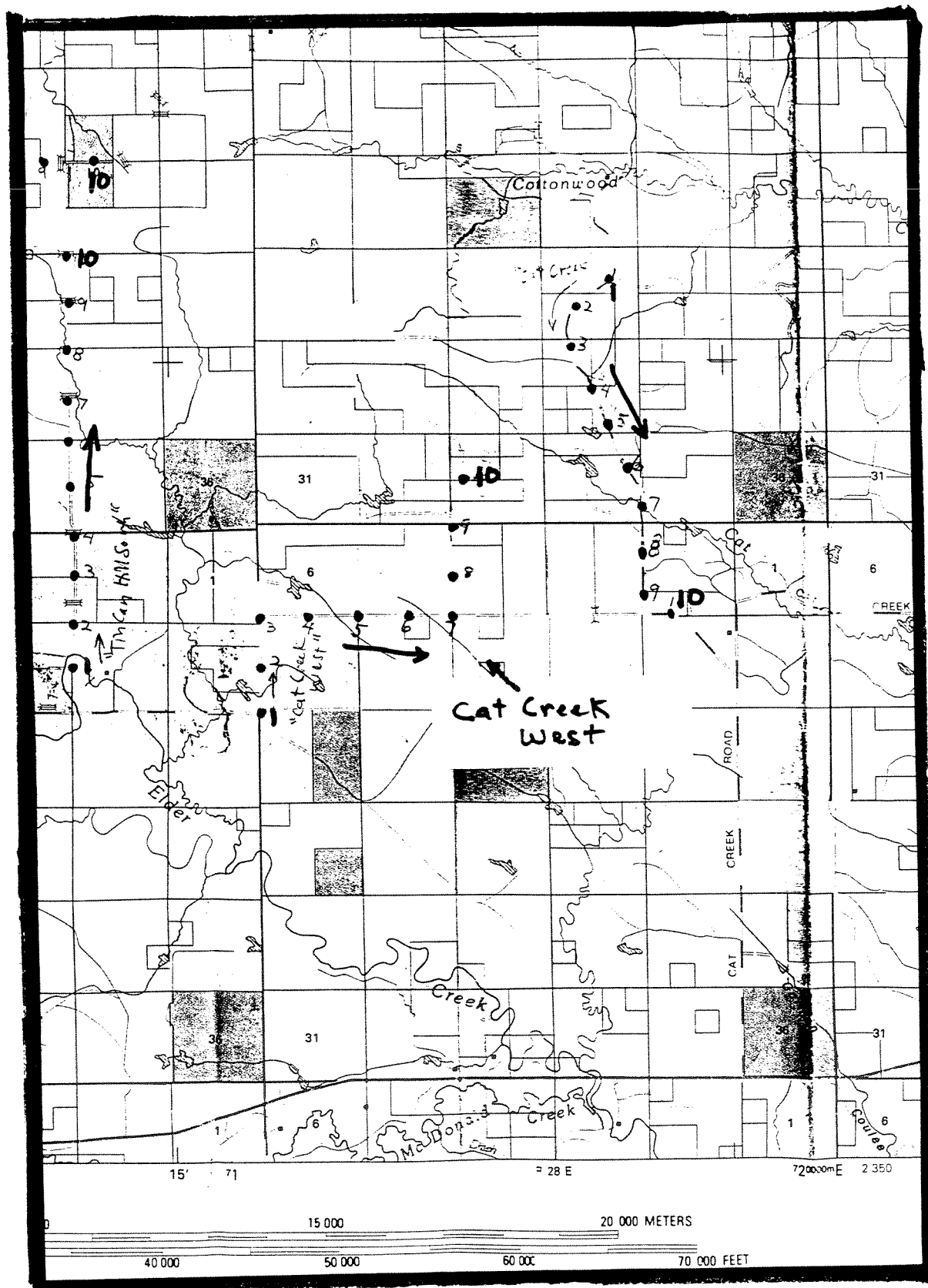
Time: start- 0635

end- 0808

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Killdeer								1		
Willet					1f					
Mourning Dove								1		
Horned Lark	1	1		1			1		1	
Barn Swallow										1f
Sage Thrasher								1		
Brewer's Sparrow			3		3	1				2
Vesper Sparrow	4	4	3	2	2	2	2	2	2	6
Lark Bunting	2	5	8	6	5	1	2	3	3	
Grasshopper Sparrow	1	1								
Western Meadowlark	8	5	6	5	7	2	6	2	3	4
Brewer's Blackbird								2	1	
Brown-headed Cowbird		1f		1		2	5	2		

Route Species Richness: 13

Comments:



ROADSIDE BIRD ROUTE

Name: Cat Creek West

Date: 20 June 1999

Habitat Description: low stature sagebrush; crested wheatgrass at stops 6, 7, 8; some dry cropland at stops 1 through 8

TRS: start- T15NR27ES10NE **end-** T16NR27ES23NW

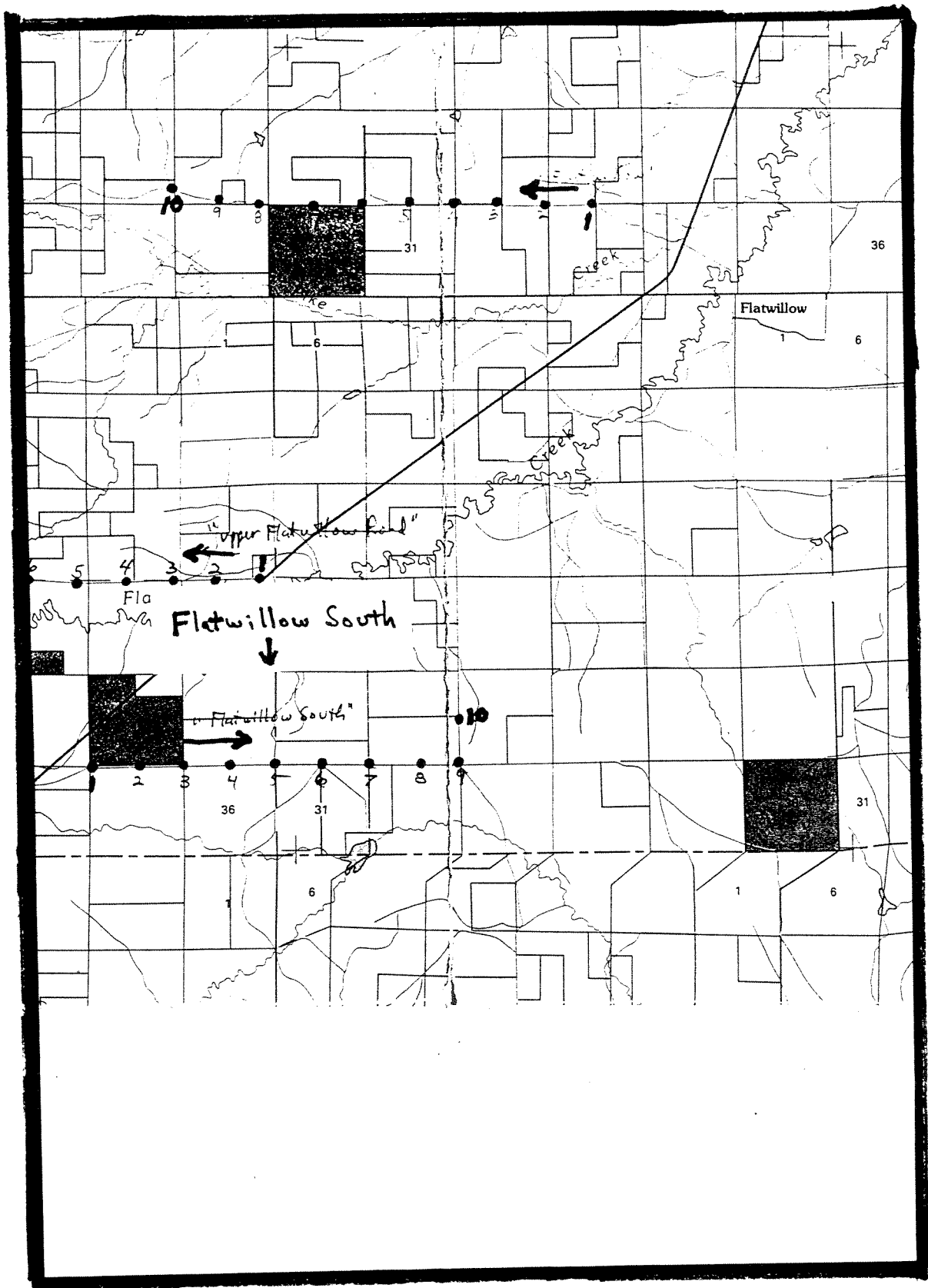
Time: start- 0833

end- 0936

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Killdeer	1									
Upland Sandpiper				1						
Eastern Kingbird	1									
Horned Lark	2	4	1	2	2	2	2	2		1
European Starling			1							
Brewer's Sparrow					1				3	3
Vesper Sparrow			1	2	1	3	6	1		2
Lark Bunting	5	6	6	9	7	1		5	2	5
Savannah Sparrow								1		
Grasshopper Sparrow					2			2	1	
Red-winged Blackbird	2									
Western Meadowlark	3	2	2	4	4	3	3	3	2	4
Brewer's Blackbird						2				
Brown-headed Cowbird			1							

Route Species Richness: 14

Comments:



ROADSIDE BIRD ROUTE

Name: Flatwillow South

Date: 21 June 1999

Habitat Description: low stature sagebrush at stops 1-3 and 10; crested wheatgrass at stops 1-4; dry cropland at stops 4-9; some mixed grassland at stops 5-9

TRS: start- T12NR25ES26SW **end-** T12NR26ES29NE

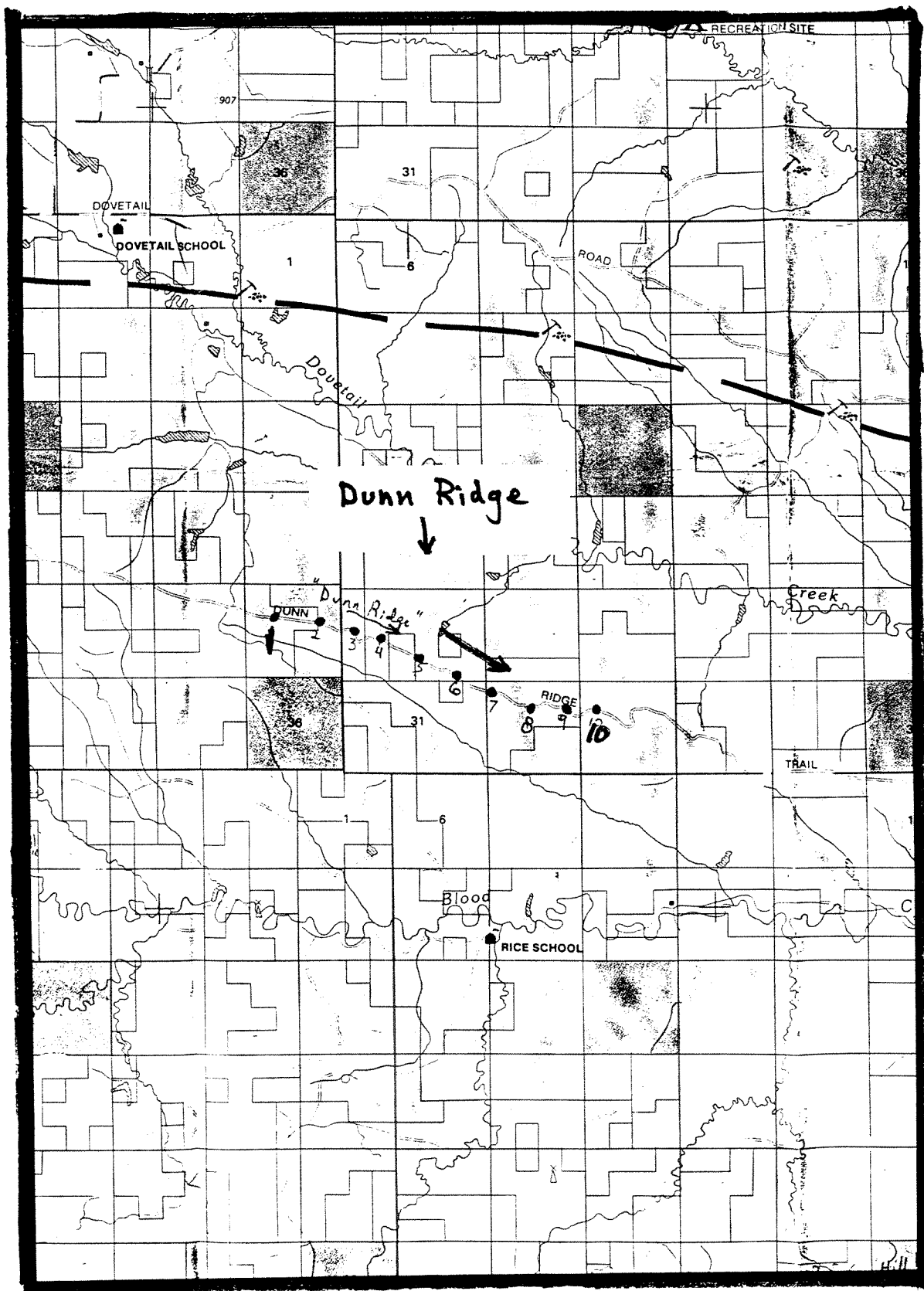
Time: start- 0609

end- 0710

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
Ring-necked Pheasant		1								
Upland Sandpiper								1		1
Ring-billed Gull					1f					
Mourning Dove		1	1	1f				1		1
Horned Lark			1	2	3		3		1	
Brewer's Sparrow		1								
Vesper Sparrow	1	2	2	1		2	2	1	1	2
Lark Bunting	7	3	10	10	6	8	22	15		
Savannah Sparrow		1			1		1			
Grasshopper Sparrow				2	1	2	2	1		
Western Meadowlark	4	3	2	4	2	4	4	3	4	7
Brown-headed Cowbird	2	2			8				2	2

Route Species Richness: 12

Comments:



ROADSIDE BIRD ROUTE

Name: Dunn Ridge

Date: 21 June 1999

Habitat Description: ponderosa pine savannah; some low stature sagebrush at stops 1, 2, 9 and 10

TRS: start- T18NR27ES25NW **end-** T18NR28ES33NW

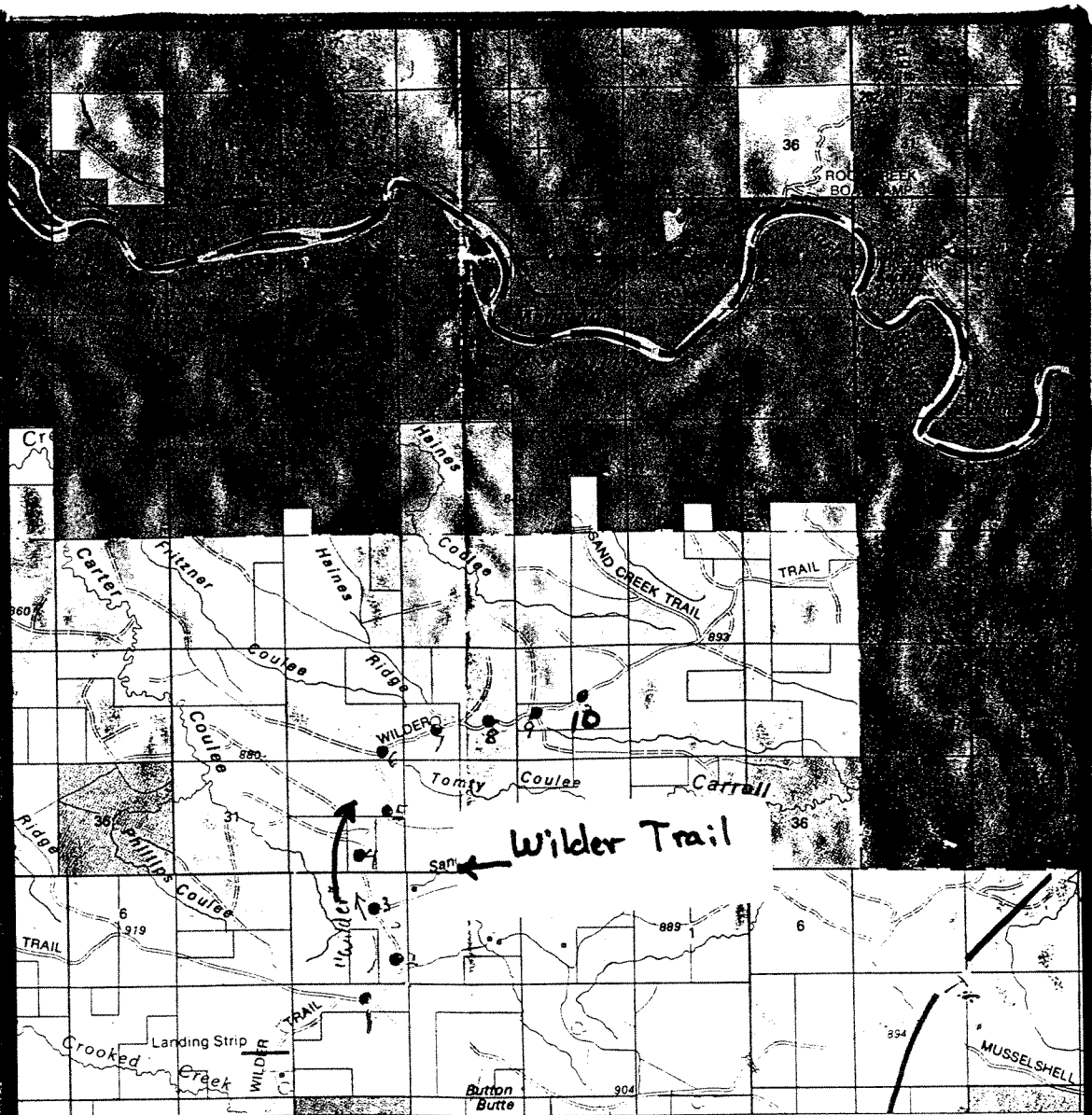
Time: start- 0855

end- 1003

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
American Kestrel			1							
Mourning Dove		1		1						
Northern Flicker										1
Western Wood-Pewee			1		1		1			
Dusky Flycatcher			1							1
Say's Phoebe									1	
Black-capped Chickadee						1				
House Wren	1				1		2			1
Mountain Bluebird	1	1	1			1	1		2	1
Yellow-rumped Warbler		1	1			1	1	1		1
Spotted Towhee	1	2		1	1	2		1		1
Chipping Sparrow		1	2	1			1	2	1	1
Brewer's Sparrow		2								
Vesper Sparrow	3	1		2	1	1	1	1	4	2
Lark Sparrow	1	1		1	5			1		2
Western Meadowlark	1		1	2	2	2	1	1	1	1
Brown-headed Cowbird						1				
Red Crossbill	2f	2f	4	1f				3		2f
Pine Siskin	1f			1f						
American Goldfinch	1f					1f				

Route Species Richness: 20

Comments: begin at cattleguard



R 25 E (WINNETT) 30'

2 250 69

R 25

18 19 20

SCALE 1:100 000

1000

1 CENTIMETER ON THE MAP REPRESENTS 1 KILOMETER ON THE GROUND
CONTOUR INTERVAL 20 METERS

5000

0

portunities



Rafting



Water-skiing



Fishing

ROADSIDE BIRD ROUTE

Name: Wilder Trail

TRS: start- T20NR25ES9NE end- T21NR25ES27NE

Date: 22 June 1999

Time: start- 0857

end- 1005

Habitat Description: low stature sagebrush; some ponderosa pine savannah at stops 4-6 and 8-10

SPECIES	STOP									
	1	2	3	4	5	6	7	8	9	10
American Kestrel		1								
Killdeer							1			
Upland Sandpiper		1								
Mourning Dove						2				
Northern Flicker										1
Horned Lark	1		1			1	1			
House Wren				1						
American Robin					1				1	
Spotted Towhee								1		
Chipping Sparrow									1	
Brewer's Sparrow		2								
Vesper Sparrow	2	3	3	3	2	2	2	3	2	2
Lark Bunting	4									
Western Meadowlark	3	4	4	5	4	4	3	3	3	1
Brewer's Blackbird									4	
Brown-headed Cowbird				1f	2			1		
Red Crossbill			1f							

Route Species Richness: 17

Comments: windy; cattle in area

DISCUSSION AND MANAGEMENT CONSIDERATIONS

The study area supports a typical shrubsteppe bird community, with intermixing of species tied closely to sagebrush and grassland. Sagebrush obligate bird species present included Brewer's Sparrow (the most widespread of these) and Sage Thrasher to a much lesser degree. Grassland birds of highest conservation priority, such as Sprague's Pipit and Baird's Sparrow, were barely represented on point counts, but may have occurred more frequently in isolated patches within the study area. Neither species, however, occurs in abundance to the degree they are present in pothole regions north of the Highline adjacent to the Canadian border (pers. obs.).

The breeding birds of the area were investigated previously in 1966 and 1967 (Feist 1968) on five 40-acre plots, prior to herbicide spraying to clear sagebrush. Brewer's Sparrow and Vesper Sparrow were the two most abundant nesting species. Western Meadowlark and Horned Lark also bred on all plots, with Lark Bunting and Sage Thrasher on three plots and Mourning Dove on one plot. Sage Grouse were observed on one plot.

Brewer's Sparrow was detected on 27% of the points during 1998-1999, which likely was an underestimate because of the timing of many counts in 1998. Western Meadowlark, Vesper Sparrow, and Lark Bunting were the three most abundant species in 1998-1999, occurring on 97.4%, 85.9%, and 61.2% of the point counts, respectively. Horned Larks were detected on 19% of the points (Table 1), but they, too, could have been undercounted because they are an early-nesting species. A striking difference between Feist's (1968) results and the point count survey is the relative abundance of Sage Thrashers on Feist's few study plots versus the rarity of Sage Thrashers at the 1998-1999 points (Table 1): thrashers were detected at only two points on two routes during the recent survey. Sage Thrashers tend to nest in taller and denser sagebrush patches (Paige and Ritter 1999). Sagebrush control in the study area that reduces larger more mature patches of big sage will adversely affect this bird species. Montana PIF (Casey 2000) recommends achieving a goal where sagebrush is at least 0.5 m in height with high foliage density. Brewer's Sparrows are less specific in their habitat needs, and will occupy low-stature sagebrush in areas with relatively low canopy cover (averaging 13%, but ranging from 6-33% in one Montana study [Bock and Bock 1987]). Both species will avoid areas recently burned or otherwise denuded of sagebrush.

The study area continues to support a large population of Brewer's Sparrows. Protection of some plots that allow continued growth of patches of sagebrush will also make them attractive to Sage Thrashers. However, densities of this species tend to be relatively low (30 individuals per km², or 78 per mi²) even in extensive areas of sagebrush with the preferred structure and density (Paige and Ritter 1999). Montana PIF (Casey 2000) recommends a long-term goal of maintaining at least 50% of existing sagebrush stands 30 years of age or older. However, this goal is not just for a static set of sites but should include the continued presence of a diverse habitat structure by maintaining variation in the grass understory. Grazing can be used as a tool to achieve and maintain this dynamic mosaic.

A number of specific recommendations pertinent to maintaining the viability of the shrubsteppe and grassland habitats in the study area, and their associated breeding bird faunas, are presented in detail in Paige and Ritter (1999) and the Montana PIF draft conservation plan (Casey 2000). It is recommended here that 1) the routes established in 1998-1999 be run in alternate years (maybe 50% of the routes each year) for at least five years to establish trends in the area, and 2) Feist's (1968) plots be resampled annually.

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APPENDIX 1. ACID SHALE PINE FOREST BIRDS

Acid Shale Pine Forest Birds

The following list of birds includes species documented at a camp on BLM land in T16N R25E S30SE (3300 ft elevation) near War Horse Lake in Petroleum County, Montana. The site is atop an outcrop of acid shale of the Bearpaw Formation forming a low east-west tending ridge in several adjacent sections of Petroleum and Fergus counties. The vegetation surrounding the ridge at slightly lower elevation is sagebrush grassland, but the acid shale outcrop soils support forests dominated by ponderosa pine (*Pinus ponderosa*) and a shrub layer dominated by horizontal juniper (*Juniperus horizontalis*). Canopy cover of forbs is sparse, the herbaceous layer is dominated by sun sedge (*Carex pennsylvanica*) and five grass species; large areas of bare soil are common. This plant community is unique in Montana (Lesica 1987) and has been little studied.

The site where the following bird observations were made is within the largest, best-developed and most diverse example of acid shale pines on public lands (Lesica 1987). The list of breeding season birds is necessarily incomplete, as the camp was occupied only during 17-22 June 1999. Nevertheless, it provides a baseline inventory of the bird species associated with this unique endemic plant community.

Common names of birds follow the A.O.U. Check-list of North American Birds, seventh edition (A.O.U. 1998).

Mallard: breeds (nest with 9 eggs, predated nest with 6 eggs, both in forest); dates- 19
Northern Goshawk: transient (immature in forest); dates- 18
American Kestrel: breeds (nest in pine snag); dates- 19,20,21,22
Killdeer: transient (flyover); dates- 20
Upland Sandpiper: breeds (adults with yng at forest edge); dates- 19,20,21,22
Mourning Dove: breeds (nest with eggs); dates- 17,18,19,20,21,22
Common Nighthawk: probably breeds (displaying males); dates- 17,18,19,20,21,22
Common Poorwill: probably breeds (calling males); dates- 17,18,19,20,21,22
Hairy Woodpecker: probably breeds (pair); dates- 19,20,21,22
Northern Flicker: breeds (nest in pine snag); dates- 18,19,20,21,22
Western Wood-Pewee: probably breeds (territorial males); dates- 17,18,19,20,21,22
Dusky Flycatcher: breeds (nest with 5 eggs [3 cowbird]); dates- 17,18,19,20,21,22
Clark's Nutcracker: transient (one in pines); dates- 20
American Crow: transient (flyover); dates- 20
Mountain Chickadee: probably breeds (pairs); dates- 18,19,20,21,22
Red-breasted Nuthatch: probably breeds (pair); dates- 21
House Wren: breeds (3 boxes with 7-egg clutches, 1 with 7 yng); dates- 17,18,19,20,21,22
Mountain Bluebird: breeds (3 nest boxes with broods of 5 yng); dates- 17,18,19,20,21,22
American Robin: breeds (nest with 3 yng); dates- 17,18,19,20,21,22
Yellow-rumped Warbler: (Audubon's) probably breeds (males singing); dates- 18,19,20,21,22
Spotted Towhee: probably breeds (singing male); dates- 19,20,21
Chipping Sparrow: breeds (adult with food); dates- 18,19,20,21,22
Vesper Sparrow: probably breeds (singing males at forest edge); dates- 18,19,20,21
Western Meadowlark: breeds (adults with food at forest edge); dates- 17,18,19,20,21,22
Brown-headed Cowbird: breeds (parasitized Dusky Flycatcher nest); dates- 20,21,22
Red Crossbill: probably breeds (flocks of males + females); dates- 17,18,19,20,21,22